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Mental illness: relation to childbirth and experience of motherhood

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The purpose of pregnancy is not merely to create a baby but also to produce a mother.

Joan Raphael-Leff, 1982

Mental illness: relation to childbirth and experience of motherhood

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This thesis comprises two population-based studies of mental illness in childbearing women in Stockholm. The principal aims in *study I* were to find out to what extent postnatal depression (PND) in mothers was identified at Well-Baby Clinics (WBCs) and to study its prevalence using the Edinburgh Postnatal Depression Scale (EPDS). The positive predictive value of the EPDS against an interview-based Research Diagnostic Criteria (RDC) diagnosis of depression was tested and sociodemographic risk factors for PND were evaluated. In *study II* the principal aims were to study the prevalence of personality disorders (PDs) and elucidate the importance of PDs, sociodemographics and health-related factors for the development of psychiatric symptoms in primiparous women. The importance of PDs and psychiatric symptoms during pregnancy as well as obstetrical factors for women's experiences of childbirth was investigated. Finally, the importance of PDs and psychiatric symptoms during pregnancy and childbirth experiences for women's experience of motherhood was studied.

In *study I*, case-records of 1128 infants were reviewed at WBCs to obtain a baseline rate of PND. Two per cent of the mothers were identified by the nurse at the WBC as depressed during the first 3 months post partum. In a second phase of the study, 309 mothers completed the EPDS questionnaire 3 months post partum. In total, 14.5% of the women scored >12 points on the EPDS. Sixty-seven per cent of these women had a depression according to the RDC. At least 8.4% of the mothers had a clinical depression. To be single and to be multiparous were significantly associated with PND.

In *study II*, 625 primiparous women were assessed during pregnancy, three and 18 months post partum using The Symptom Checklist-90, the modified SCID screen and the Global Assessment Functioning Scale. At three and 18 months post partum the Maternal Adjustment and Maternal Attitude questionnaire was added. Two weeks after childbirth visual analogue scales for childbirth experiences were filled in. Obstetrical and neonatal case-records were scrutinised. The prevalence rate of PDs during pregnancy was 6.4%. PD was strongly associated with psychiatric symptoms during and after pregnancy and also with long-lasting psychiatric symptoms. Psychiatric caseness during pregnancy was strongly associated with psychiatric caseness post partum. Socio-economic status, to be younger and previous treatment for mental problems were identified as risk factors for psychiatric symptoms. Obstetric factors such as instrumental delivery and epidural analgesia were of greater importance for negative birth experiences than mental illness during pregnancy. The process of adjustment to motherhood was impaired in women with mental illness during pregnancy. PD was as negative for adjustment to motherhood as psychiatric symptoms. The impact of a negative birth experience on adjustment to motherhood tends to diminish over time.

Keywords: population-based study, depression, personality disorder, psychiatric symptoms, mode of delivery, childbirth experience, maternal adjustment

LIST OF PUBLICATIONS

The present thesis is based on the following papers, which will be referred to in text by their Roman numerals:

I. Bågedahl-Strindlund M., Monsen Börjesson K.. Postnatal depression: a hidden illness. *Acta Psychiatrica Scandinavica 1998:98:272-275*

II. Börjesson K., Ruppert S., Bågedahl-Strindlund M.. A longitudinal study of psychiatric symptoms in primiparous women: relation to personality disorders and sociodemographic factors. *Archives of Women's Mental Health 2005: published online*

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IV. Börjesson K., Bågedahl-Strindlund M.. Personality disorder, psychiatric symptoms and childbirth: relation to motherhood experiences. *submitted*

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LIST OF ABBREVIATIONS

ANC	Antenatal clinic
APA	American Psychiatric Association
CI	Confidence interval
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders, 3rd edn. revised
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th edn.
EDA	Epidural analgesia
EPDS	Edinburgh Postnatal Depression Scale
GAF	Global Assessment Functioning scale
GEB	Global Experience of Birth
GSI	Global Severity Index
ICD-10	International Classification of Diseases and Related Health Problems, 10th revision
MAMA	Maternal Adjustment Maternal Attitude
OR	Odds ratio
PD	Personality disorder
PND	Postnatal depression
RDC	Research Diagnostic Criteria
SCID screen	Structured Clinical Interview for DSM-III-R (self-report questionnaire)
SCL-90	Symptom Checklist –90
SES	Socioeconomic status
VAS	Visual Analogue Scale
WBC	Well-baby clinic

INTRODUCTION

Mental illness has a negative impact on women's well-being and quality of life, irrespectively of pregnancy, childbirth and motherhood. However, pregnancy and becoming a mother constitute an important, - if not the most important - and overwhelming period in a woman's life. During pregnancy women are preparing themselves for giving birth as well as becoming a mother. Pregnancy is also a period of life stress and psychological vulnerability. Mental illness during this sensitive period in a woman's life might negatively affect her relations with her child and partner and her future adjustment to motherhood, as well as her own future mental health. As almost all women in Sweden attend an antenatal health care clinic (ANC) during pregnancy and a well-baby clinic (WBC) when the child is born, midwives and child-care nurses play an important role in providing support and care for the woman and her child.

History

Mental illness in childbearing women has been of scientific interest for a long time. In the middle of the 19th century, modern-day perinatal psychiatry was founded by Jeanne Etienne Esquirol and Louis Victor Marcé (1). Since the 1960s, starting with the works of Hamilton (2), Paffenberger (3) and Pitt (4), our knowledge of perinatal mental illness and its consequences for the women as well as their children (5, 6) has increased enormously. In Sweden, important early research in this field was conducted by such authors as Jansson (7), Nilsson and Almgren (8), Uddenberg (9) and, more recently, Bågedahl-Strindlund (10, 11). The complexity of the psychological, physiological and environmental processes involved in mental illness and the negative consequences for the fetus during pregnancy as well as for the child post partum (12, 13) are now beginning to be understood in perinatal psychiatry.

Mental illness in childbearing women

The main categories of mental illnesses studied in childbearing women are traditionally described as postpartum blues, depression during and after pregnancy and puerperal psychosis. Postpartum blues is a well-known and common condition of transient emotional lability affecting 50-70% of all mothers in most cultures the first week post partum (14). The blues can hardly be considered to be a disorder (15), although some authors indicate vulnerability to a later postpartum depression (16, 17). The blues is probably caused by the rapid postpartum hormonal changes, tiredness and the overwhelming and stressful experience of giving birth to a child (14).

The prevalence rate of postpartum depression ranges between 7 and 13%, depending on different methods of measuring (18, 19). Lower figures are found if depressive disorder is assessed according to clinical diagnostic criteria (18, 20). Among childbearing women, the prevalence rate of major depression has been found to be 4.3% and, among

non-childbearing women 3.3% (21). The prevalence rate of psychiatric disorders measured in community surveys shows that female psychiatric illness predominantly consists of depressive and anxiety states (22, 23), which also holds true for childbearing women (18). The symptomatology of affective disorders among childbearing women has not been found to differ from that of non-childbearing women (24, 25) and postpartum depression is no longer considered to be an independent diagnosis (15, 18, 24).

Poor social adjustment, poor social support and marital difficulties are well-known risk factors for depression among childbearing women (19, 21, 24, 26, 27). A previous personal and family history of psychiatric illness is also strongly associated with postpartum depression (19, 24, 28).

The prevalence rate of puerperal psychoses is 1-2‰ (14). Puerperal psychosis has an acute and dramatic onset, usually within the first week post partum and demands specialist treatment in psychiatric in-patient settings (14, 29). In a large Danish study (30), the relative risk of first admissions for psychosis was more than three times higher during the first three months post partum. This indicates a clearly elevated risk but still a lower rate than the reported earlier by Paffenberger (31) and Kendell (32). Puerperal psychosis is associated with recurrent and further psychiatric illness (33, 34).

Several authors have studied personality characteristics in relation to mental illnesses in childbearing women. A number of personality traits, i e. attributional style (35), neuroticism and extraversion/introversion according to the Eysenck Personality Inventory (4, 26, 36) and interpersonal sensitivity (37) have been found to increase the vulnerability to mental illness and mainly postpartum depression.

The reported prevalence rate of personality disorders (PDs) among non-childbearing women in Scandinavia ranges from 4.9% in Finland (38) to 12.4% in Sweden (39) and 12.6% in Norway (40). However, no study has been reported so far regarding PDs according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) (41) or International Classification of Diseases and Related Health Problems (ICD system) (42) among childbearing women, specifically.

Identification of mental illness during pregnancy and post partum

Women who are mentally ill (mainly depressive and anxiety disorder) during pregnancy or the postpartum period are not likely to seek help from professionals (43, 44). The feelings of guilt, low self-esteem and hopelessness accompanying depression might explain the fact that women do not talk about their emotional distress or apply for help from professionals. However, mental illnesses in childbearing women has also been shown to be under-diagnosed (43, 45) and neglected by professionals (43, 46, 47).

Nearly all pregnant women in Sweden attend an (ANC) (48) for regular visits during pregnancy and all pre-school children are offered specific child-health programmes through the (WBCs). Nearly 100% of the children are enrolled in the child-health programmes (49). In other words, our health-care systems offer good opportunities for professionals to get information on the women's emotional state and, hence, to offer help and support. At the time when I started my investigation, we did not know the extent to which staff at the WBCs in Sweden identified depressed mothers.

In addition to thorough history taking in the clinical setting, screening tools such as the Edinburgh Postnatal Depression Scale (EPDS) (50) can be used to identify women with depression. The EPDS was originally designed to detect postpartum depression and, later on, was also validated for use in non-postnatal women (51). The EPDS was constructed as an alternative to existing questionnaires, which were used to identify depression and anxiety disorders in the general population, but not designed and validated for postpartum women. In the first validation study of the EPDS in Sweden (52), 13% of the women were identified as having a depression three months post partum.

In 1981, the Swedish National Board of Health and Welfare (53) formulated the primary goal of antenatal health care as being that "as healthy babies as possible are to be born by as healthy and well-prepared women as possible." Both physical and emotional needs are to be met and as part of this goal, disturbances in the mother and child relationship and psychiatric disorders were pointed out as special topics of concern. In clinical settings such as ANCs/WBCs, self-report questionnaires such as EPDS could easily be administered and incorporated in the routine work. However, if routine screening is to be implemented in ante-/postnatal care, educational programmes for healthcare professionals must be provided (54), and professional collaboration needs to be established (28) so that women, can be offered treatment and support if needed (54).

Self-report questionnaires and methodological issues

Reliability and validity

Psychiatric self-report questionnaires are frequently used in studying mental illness among childbearing women. In a meta-analysis of 59 studies of postpartum depression carried out during 1980-1995 (19), self-report questionnaires such as the Beck Depression Scale (BDI) (55), the Centre for Epidemiological Studies Depression Scale (CES-D) (56), the Zung Self-Rating Depression Scale (Zung SDS) (57) and the EPDS (50) were used in nearly half of the studies. In the other studies, the diagnoses were interview-based. In order to measure general psychopathology in childbearing populations, such questionnaires as the General Health Questionnaire (GHQ) (58) and the Symptom Check-List (SCL-90) (59) have been used (18, 21, 26, 60). The advantage of using self-report questionnaires is the less time-consuming procedure and the possibility of studying large samples. The assessment procedure does not require

interviewers specially trained in psychiatry (61). However, there are also limitations in using self-report questionnaires, such as different response styles. This refers to the individual's ability to understand and interpret the questions adequately, and a tendency to routinely answer the questions without consideration of the content (61). Another limitation is the marked skewness of the score distribution, as the majority of people in the general population do not have psychiatric symptoms (61).

The evaluation of reliability indicates the accuracy or precision of an instrument (62) and concerns the stability and predictability of the instrument. The reliability is sometimes problematic; especially the test-retest correlations are variable due to the variety of time specifications for psychiatric symptoms among different instruments (61). Long-term test-retest reliability is of special concern when assessing PDs due to the long-lasting characteristics of PDs (63). Measures of the internal consistency reflecting the homogeneity of items are found to be more consistent between different psychiatric scales (61).

Validity concerns the question of whether an instrument measures what it is supposed to measure (62). Different aspects of validity are content validity, or the relevance to the items to the studied phenomena, and comparison with external criteria, so-called criterion validity (62). Regarding the validity of self-rating scales (64), numerous studies have been reported with promising results on comparing the empirical clustering of symptoms with clinical syndromes. Tsuang et al. suggest that the strong correlation of the existent psychiatric self-rating scales is probably due to their common focus on depression and anxiety disorders.

Sensitivity and specificity

The purpose of using self-report questionnaires as instruments in screening procedures is to identify individuals with a disorder in an apparently healthy population (65). The sensitivity of a test refers to the proportion of correctly identified individuals who have a disorder. The specificity of the test refers to the proportion of individuals who are correctly identified as not having a disorder. With high sensitivity very few, if any, individuals with a disorder are missed, on the other hand more individuals are falsely identified as having a disorder due to reduced specificity. If the test is based on a continuous variable, the level of sensitivity and specificity is decided by changing the cut-off point of scores (65, 66).

Personality disorders

Personality disorder according to the DSM system

The general definition of personality disorders according to the categorical diagnostic system of the DSM-IV is *"an enduring pattern of inner experience and behaviour that deviates markedly from the expectations of the individual's culture, is pervasive and*

inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment." (67).

In the DSM system PDs are grouped into three clusters, clusters *A*, *B* and *C*, based on common psychological features of each cluster. The diagnosis of a PD is not to be used if expressions of PD only occur during an episode of other mental disorders, such as mood, anxiety or psychotic disorders. A person can satisfy the criteria for more than one PD simultaneously (67).

PDs in cluster *A* are characterised as being odd and eccentric. This cluster represents personality traits such as suspiciousness, distrust and detachment from social relationships, as well as a lack of interest in emotional involvement. Cluster *A* includes paranoid, schizoid and schizotypal PDs. Individuals in cluster *B* appear to be dramatic, emotional or erratic. Cluster *B* includes antisocial, borderline, histrionic and narcissistic PDs. Individuals in cluster *C* are often described as anxious or fearful. Cluster *C* includes avoidant, dependent and obsessive-compulsive PDs. In DSM-III R (41) (the former version of the DSM system), cluster C also comprised passive-aggressive PD. This group has been omitted in DSM-IV.

Personality disorders and psychosocial functioning

Key characteristics of PDs are impaired or disruptive interpersonal relationships, a negative or disturbed perception of self, one's inner world and the environment (68, 69). PDs have been shown to be strongly associated with such psychiatric disorders as depression (63, 70, 71), impaired social functioning (70, 72) and marital difficulties (73). Individuals with PDs are also found to be younger, less educated and more unemployed (39, 73). A large epidemiological study confirms that PDs in their own right predict disability and mental health consultations such as visits to general practitioners, psychiatrists and psychologists, irrespective of other psychiatric disorders or physical conditions (74).

Categorical *vs* dimensional approach

There has been an intense debate as to whether to regard PDs as a categorical phenomenon as in the DSM and ICD systems or as dimensional (75, 76). The dimensional model considers the different types of personality traits as a continuum from normality to psychopathology without strict boundaries (75, 77, 78), whereas the categorical approach describes PDs as discrete entities, with defined boundaries. In the forthcoming DSM-V, the categorical and dimensional views will probably merge in more complex models (79).

Experiences of childbirth

The experience of childbirth is influenced by such different factors as mode of delivery, pain (80-83) and interventions (84). Childbirth experiences are important for women´s

emotional well-being (19, 82). Negative subjective feelings regarding pregnancy and delivery have been found to be associated with postpartum depression, without association with obstetrical complications (85). Robson and Kumar found maternal affection to be reduced if the mother had experienced a painful and unpleasant labour (86). Women with negative birth experiences not only give birth to another child significantly later, but also have fewer subsequent children than women with a positive birth experience (87).

A positive birth experience has consistently been found to be associated with such psychological factors as perceived control during labour, involvement in decision making during the labour process, positive expectations of labour and pain relief (80-82, 88-90). Communication with and support from caregivers during childbirth are known to be important factors in the childbirth experience (80, 82, 89, 91). This was also confirmed in a systematic review comprising 14 000 women in nine countries by Hodnett (84). Emotional and social support *per se* are important for childbirth experiences, but so are different aspects of social support, such as the amount of support received, the quality of support and network resources and how women perceive the support given (92).

Personality and childbirth experiences

Studies of the importance of psychiatric illness and personality for women's experiences of birth are few in number. Trait anxiety and depressive symptoms were found to be strongly associated with a "high childbirth burden" in a retrospective study by Bergant et al. (83). A weak correlation between neuroticism and labour pain was found in another study (93). Thorp et al. (94) have reported a positive correlation between high neuroticism and introversion scores on the Eysenck Personality Inventory and anxiety prior to Caesarean section. However, in a prospective study by Waldenström (80), no association was found between trait anxiety and birth experiences.

Negative expectations of childbirth have also been demonstrated to be associated with negative childbirth experiences (82, 95, 96). In a study by Uddenberg et al. (97), an association was found between mothers´ and daughters´ experiences of childbirth. Daughters of reproductively maladjusted mothers were found to have more complicated deliveries, lacked confidence and were more anxious in looking after their children.

Experience of motherhood

Transition to motherhood

For most women, pregnancy is a positive psychological process of preparation for motherhood, starting early on during the pregnancy (98-100). Most women have a very positive experience of motherhood (101), regardless of age or parity (102). During pregnancy women actively seek information to construct their new identity and

visualise themselves as mothers to-be (100, 103). Depression and low self-esteem during pregnancy have been found to impair feelings of achieved competence as mothers post partum (103, 104). Emotional difficulties such as ambivalence and fears specific to maternity have been demonstrated to be significantly associated with conflicting relationships and depression during pregnancy (27). In the early 1960s, Davids et al. (105) found manifest anxiety among pregnant women to be associated with greater dissatisfaction with the role of being a mother and when their children were eight months old, the children were found to have impaired mental, motor and emotional development.

Adjustment to motherhood post partum

As early as in the early 1970s, Weissman et al. (6) reported that concurrent depression and anxiety in new mothers had a negative influence on the experience of motherhood and the mother-child interaction. The experience of motherhood in depressed mothers is characterised by the symptomatology of depression (106, 107), i e. low self-esteem, lack of self-confidence and excessive feelings of guilt. In studies focussing on the relative importance of different psychosocial factors correlated with the experience of motherhood, several authors have found concurrent depression and anxiety to be some of the most important factors (101, 104, 106-108).

Postpartum depression has also been found to be associated with a delayed onset of maternal affection for the child (86), negative attitudes to children (26, 108, 109) and an impaired mother-child interaction (110-112). Particularly long-term depressions are found to have a negative impact on the mother-child interaction (110, 112). Such personality traits as empathy and impulsivity (106, 113), neuroticism (36, 106, 113) and interpersonal sensitivity (37) are other important factors in women's experiences of motherhood and mother-child interaction. To our knowledge, no previous study has been published regarding the importance of personality disorders as defined by the DSM criteria (67) for women's experience of motherhood.

Mental illness and child development

Numerous studies have found mental illness in mothers to be associated with negative emotional and cognitive development in the children during the whole period from infancy up to and during school age (5, 10, 114-119). A number of longitudinal studies have confirmed that children of affectively ill parents have a 40% risk of experiencing an episode of major depression during their first 20 years of life (120). Children of postnatally depressed mothers are also more likely to have general difficulties in functioning, interpersonal problems and problems of attachment (114). Several studies have reported an increased risk of mental disturbances in children of mothers with psychotic disorders (121-123) due to multiple biological, social and family environmental factors. Bågedahl-Strindlund et al. reported from their longitudinal study that children of severely mentally ill mothers in Sweden were placed more often in

foster homes and consequently live to a lesser extent with their mothers (10). Few studies have examined the impact of acute postpartum psychoses on the child (124). Murray et al. (124) assume that the absence of reported adverse effects on the children is probably due to the limited exposure to the maternal illness.

Rutter and Quinton (5) found the co-existence of PDs in mentally ill parents to be a strong predictor for mental disturbances in children during an observation period of 4 years. The group of mentally ill parents with a co-existing PD had more marital discord and social impairment, and more affective disorders were found in the spouses. Rutter and Quinton claim that the entire psychosocial environment must be taken into account when considering the impact of parental mental disorder on the children's well-being and development.

On the basis of the lack of knowledge in certain of the above-described areas, the following projects were carried out.

AIMS

This thesis has three general aims: Firstly, to find out the extent to which maternal postnatal depression is identified at the WBCs and to study its prevalence. Secondly, to study the prevalence of personality disorders and their association with psychiatric symptoms among childbearing women. Thirdly, to study the importance of personality disorders and psychiatric symptoms for women's experiences of childbirth and of motherhood.

Paper I

The main objectives of the present study were to find out the extent to which postnatal depression in mothers were recognized by Well Baby Clinics in Stockholm. We also wanted to study the prevalence of postnatal depression using the EPDS and to test the positive predictive value of the EPDS against an interview-based diagnosis of depression according to the Research Diagnostic Criteria. Finally, we wanted to identify sociodemographic risk factors for postnatal depression.

Paper II

The aims of the study were to examine the prevalence of personality disorders and to highlight the importance of personality disorders, sociodemographic and health-related factors for the development of psychiatric symptoms in primiparous women during pregnancy and the postpartum period.

Paper III

The aims of the study were to examine the importance of having a personality disorder or being identified as a psychiatric case during pregnancy for women's experience of childbirth. We also wanted to study the importance of obstetrical factors and women's own mothers' childbirth experiences for women's experiences of childbirth.

Paper IV

The aims of the study were to study the importance of personality disorders and psychiatric symptoms during pregnancy, childbirth experiences and sociodemographic factors for women's experience of motherhood.

MATERIAL AND METHODS

Participants and procedures

Study I (paper I)

Procedure

In a two-step procedure, the occurrence rate of postnatal depression (PND) was investigated in a multi-ethnic area in the southern Stockholm region. The population in the *first phase* of the investigation was all mothers (n=1128) of children born in 1992 visiting either of 15 Well-Baby Clinics (WBCs) in the area. The nurses at the WBCs reviewed the charts of the infants retrospectively in order to find comments indicating maternal depression during the first six months after the child was born. The nurses had received oral and written information about the definitions of depression according to Research Diagnostic Criteria (RDC) (125). The screening procedure was carried out during the autumn of 1993. All mother-baby pairs were well-known to the nurses as they had visited the WBCs regularly. This investigation was made in order to determine a baseline rate of *observed* postpartum depression in this area.

The *second phase* of the investigation was based on *all* Swedish-speaking mothers with a child born from August 1993 to and including July 1994 (n=362) visiting nine WBCs in the area. The mothers were asked to complete an EPDS questionnaire (50) three months after delivery. Women scoring >12 were invited to a diagnostic interview by a psychiatrist (M BS). The diagnoses were based on the RDC to allow comparisons with earlier studies on PND. If needed, the mothers were offered appropriate help and treatment. Sociodemographic data such as age, nationality, marital status (at the time of the first visit to the WBC) and parity were also recorded.

Participants and loss of data

The *first phase* of the study comprised all 1128 mother-baby pairs attending the WBCs in the area. In the *second phase* of the study 309 of 362 Swedish-speaking mothers (85%) completed the EPDS questionnaire when the child was roughly three months old (mean age 13.5 weeks). The mean age of the women was 28.2 years (SD $\pm$5 years). One hundred and eighty-seven (34%) of all newly delivered mothers did not have a sufficient knowledge of the Swedish language to join the study. Twenty-nine women (8%) were not included due to various administrative problems and 24 women (7%) declined to participate in the study.

Study II (papers II-IV)

Procedure

Study II is a longitudinal and prospective study based on all primiparous Swedish-speaking women (n=625) attending six antenatal clinics (ANCs) located in the southern part of the county of Stockholm. The women were included consecutively in the study

from October 1996 through July/August 1998. However, two ANCs started the inclusion procedure later, one in December 1996 and another in November 1997. The midwives at the ANCs briefly informed the women about the project. At entry into the study (mean gestation 22 weeks; range 15 - 28 weeks), one of the researchers (K.B. or S.R.) met the women at the ANC and more extensive information was given about the purpose of the project. A brief interview was conducted to obtain information regarding previous and current psychiatric or psychological treatment and the ANC case-notes were scrutinised for sociodemographic and health-related data. Information on alcohol consumption and smoking habits were collected from the ANC case-notes. After the interview, the women were asked to complete the following self-report questionnaires: the Symptom Checklist –90 (SCL –90) (59) for psychiatric symptoms, the modified SCID screen questionnaire (72, 126) for personality disorders and a modified self-report version (127) of the Global Assessment of Functioning Scale (GAF) (41). With some women (n=79; 13%) it was not possible to arrange a personal meeting. In these cases, interviews were conducted by telephone and the questionnaires were distributed by post.

Two weeks post partum, a questionnaire with visual analogue scales pertaining to childbirth experiences was administered to the women. The postpartum questionnaires were distributed by post. All but five women gave birth on maternity wards in Stockholm.

Three months post partum (mean 13.5 weeks; range 11-26 weeks) the women filled in the questionnaires regarding mental health and again at 18 months (mean 18.2 months; range 17-23 months) following childbirth and, at the same points in time they filled in a questionnaire concerning maternal adjustment and maternal attitude (MAMA) (128). At the final assessment a questionnaire for psychosocial information was filled in.

Information regarding obstetric and neonatal data was collected from the maternity ward records. In order to avoid bias in the process of collecting obstetrical and neonatal data, only information from the standardised maternity ward records was extracted.

Participants

The original study sample comprised 625 women. The mean age of the women was 27.2 years (range 16-42 years). During the inclusion period, 806 primiparous women were admitted to the ANCs, but 91 women did not speak Swedish speaking sufficiently and therefore 715 women remained available for the study. Fifty-seven women (8%) were not included due to various administrative problems and 33 women (5%) declined to take part in the study.

Loss of data

Five women were excluded because they had a stillbirth. Six women never answered the questionnaire as regards birth experiences two weeks post partum, and another two women did not answer the question about their global experience of birth. Seven obstetric case records and eight neonatal case records were never found. At three months post partum, 14 women never completed the self-report questionnaires regarding their mental health and an additional woman did not complete the MAMA questionnaire. At 18 months post partum, altogether 18 women had not filled in the SCID screen questionnaire, the GAF and the MAMA questionnaire. Nineteen women did not fill in the SCL –90 questionnaires.

The total attrition rate during the project was 39/625 (6%), including women with stillbirths. The attrition group was significantly more long-term unemployed ($P<0.001$) and more often smoking ($P=0.004$). No other significant differences were found between the attrition group and the group of women who participated throughout the study as regards the background variables.

A summary of the participants and loss of data in studies I and II is presented in Table 1.

Table 1. Participants and loss of data

Study I - paper I
Phase 1
1128 mother-child pairs (all WBC:s in the area, n=15)

Phase 2
549 women (at 9 WBC:s)
187 women not Swedish speaking
362 women available for the study
29/362 (8%) not included due to administrative problems
24/333 (7.2%) declined to participate

309 women answered the EPDS questionnaire – final study population
39 women were interviewed according to RDC

Study II - paper II – IV
806 women (at 6 ANC:s)
91 women not Swedish speaking
715 women available for the study
57/715 (8%) not included due to administrative problems
33/658 (5%) declined to participate

625 women – final study population

1st assessment (during pregnancy)
624 women answered the SCID screen and GAF questionnaires
625 women answered the SCL –90 questionnaire

2nd assessment, 2 weeks post partum (n=612)
5 women excluded due to stillbirth
6 women never answered the VAS questionnaire
2 women gave incomplete answers of the VAS questionnaire
7 obstetric medical records were missing
8 neonatal medical records were missing

3rd assessment, 3 months post partum (n=605/606)
14 women never answered the SCID screen, GAF and SCL-90 questionnaires
15 women never answered the MAMA questionnaire
(the woman who didn't answered the SCID screen during pregnancy answered at 3 months post partum)

4th assessment, 18 months post partum (n=587/588)
18 women never answered the SCID screen, GAF and MAMA questionnaires
19 women never answered the SCL –90 questionnaires

Total attrition rate in study II was 39/625(6%) and five women were excluded due to stillbirth.

Self-report questionnaire and diagnostic interview (paper I)

Edinburgh Postnatal Depression Scale (EPDS) (50): The EPDS was used to identify women with a possible postpartum depression. The EPDS is a 10-item self-report questionnaire specifically designed to screen for PND in community samples. Each item is scored from 0 to 3, and the maximum total score is 30. High scores indicate a possible depression. The scale rates the intensity of depressive symptoms present during the previous 7 days. In the original validation study with a cut-off score of >12, Cox found a sensitivity of 86% and a specificity of 78% for a RDC depression (50). In a later validation study by Murray and Carother (66) using the same cut-off score, a specificity of 96% and a sensitivity of 68% were found for a major or minor depression according to RDC. In the present study, a cut-off of >12 was chosen.

Research Diagnostic Criteria (RDC)(125): Diagnoses of psychiatric disorders were made using RDC diagnostic interviews. RDC are based on specific diagnostic criteria for functional psychiatric illnesses and are widely used in research settings related to the epidemiology of perinatal psychiatry. RDC comprises 25 major diagnostic categories and these are further subdivided into non-mutually exclusive subtypes. The kappa coefficients of reliability for major and minor depressive disorders were found to be 0.90 and 0.81, respectively (125).

Self-report questionnaires and measures (papers II-IV)

Interview at inclusion to study II: A brief interview was conducted after the women had agreed to participate in the study. The following information was collected: earlier infertility, previous psychiatric or psychological treatment and current psychiatric or psychological treatment. Information was also collected regarding previous or current drug abuse and the type of drugs. Information regarding socioeconomic status (SES) was classified according to a system devised by Statistics Sweden (129). However, in our study, the original highly detailed classification was collapsed into four groups including (1) non-manual employees and professionals (2) students on a post-secondary school level, (3) workers and (4) long-term unemployed persons including those involved in educational programmes for adults.

Symptom Checklist-90 (SCL-90): The SCL-90 (59) is a self-report psychiatric 90-item questionnaire. It has a five-point scale: 0=not at all, 1= a little bit, 2=moderately, 3= quite a bit, 4=extremely and measures the symptoms during the past week. The checklist covers nine subscales: somatisation, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. It also provides a Global Severity Index (GSI) as an expression of the individuals global symptom strain. In the latest version of the scale, the SCL-90R (130), two questions have been changed compared with the SCL-90. Two studies comparing

the two versions found no significant differences regarding the GSI score (131) or the subscales (132).

Psychiatric caseness: There is no generally accepted cut-off for psychiatric caseness using the SCL-90. By using GSI cut-off limits of 0.5 or 1.0, it has been shown that individuals with psychiatric diagnoses in out-patient settings can be identified by the SCL-90R with reasonably good sensitivity and specificity (133-135). In the present study, the cut-off for psychiatric caseness was set to a GSI score of $\geq$ 0.93. This corresponds to 2 SD above the mean (0.31) based on non-patient norms published by Derogatis (130).

SCID screen questionnaire: A modified version of the SCID screen questionnaire (126) available in a Swedish translated version was used. In this modified version (72) items covering criteria for an antisocial personality disorder were added. The modified version includes 124 yes or no questions reflecting 103 corresponding Axis II criteria according to DSM-III-R for the diagnosis of paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent, obsessive-compulsive, passive-aggressive and self-defeating personality disorders. The original SCID screen questionnaire is constructed to be overly inclusive. By adjusting the cut-off level by requiring one more criterion for diagnosis for every PD, Ekselius et al. have demonstrated an overall sensitivity of 86.5%, a specificity of 75% and a kappa agreement of 0.78 between clinical SCID interviews and the modified SCID screen questionnaire in a patient sample (72).

GAF self-report: A modified self-report version (GAF self-report) (127) of the Global Assessment of Function Scale, according to Axis V, DSM-III-R (APA, 1987), was used to provide evidence of subjective distress or significant impairment of social or occupational functioning. This information is necessary to meet the DSM criteria for PD. The modified self-report version of GAF consists of the original 1–90 point scale but with fewer defining characteristics than the original one. The questionnaire has been validated against expert ratings (by well-trained psychiatrists or therapists) and the correlation was found to be $r=0.62$ ($P<0.001$) (127).

Definition of personality disorder: It is stated in the instructions for the person filling in the modified SCID screen questionnaire, that the time frame covers the *last few years* to distinguish state from trait. The criteria for a PD in the present study were chosen as follows: (i) meeting the criteria for a PD with the modified SCID screen questionnaire with an adjusted cut-off *and* (ii) a GAF score of $\leq$70.

Mental health: In paper III and IV the women were divided into three independent groups which (1) neither satisfied the criteria for psychiatric caseness nor had a PD (non-case/non-PD), (2) satisfied the criteria for having a PD or (3) satisfied the criteria

for psychiatric caseness, but not a PD. As some women in the PD group also were defined as psychiatric cases, these two groups were analysed separately. No significant differences were found as regards sociodemographic and health-related factors.

Childbirth experience questionnaire: This questionnaire consisted of seven visual analogue scales (VAS*)* and was designed for this study. The scales ranged from 0 to 100 mm, low scores representing positive experiences and high scores negative experiences of perceived pain and anxiety, perceived support from partner and staff, satisfaction with pain relief and trust in staff in connection with childbirth. Finally, there was a question concerning *global experience of childbirth* (GEB) which was the main outcome variable. Vaginally delivered women and women delivered by emergency Caesarean section answered the question "My total experience of childbirth was much more positive than I expected *to* much more negative than I expected," representing the endpoints. Women delivered by elective Caesarean section answered a rephrased question ranging from "My total experience of Caesarean section was much more positive than I expected *to* much more negative than I expected," as this represented their experience of childbirth. As several studies have shown that 75-83% of newly delivered women are satisfied or very satisfied with their childbirth (5, 32-36), the women were divided into two groups by the cut-off score for the upper quartile. Women with a score of $\leq$55 mm were considered to have had a more positive experience than expected and women with a score of $\geq$ 56 mm a more negative experience than expected. A question was also posed to elucidate what the women knew about their own mothers´ childbirth experiences.

Obstetrical and neonatal data: The standardised maternity ward records were scrutinised for obstetric information regarding: multiple births, length of gestation, augmentation with intravenous oxytocin, epidural analgesia (EDA), total labour time from cervical dilation =3/4 cm to partus, mode of delivery, perineal tears and total amount of bleeding. Information regarding neonatal health was collected as follows: exposure to scalp blood sampling, Apgar score $\leq$ 7 p at 1 minute and 5 minutes and whether the child had been transferred to the neonatal ward for $\geq$ 4 days.

Maternal adjustment and maternal attitude (MAMA) questionnaire: The MAMA questionnaire is a 60-item self-report questionnaire developed by Kumar and Robson (128) to measure maternal adjustments and attitudes during the pregnancy and to the baby. The complete questionnaire consists of five subscales: body image, somatic symptoms, marital relationships, attitudes to sex and attitudes to the pregnancy/baby. In the present study a postnatal version of the latter subscale regarding maternal adjustments and attitudes to the baby was used. It consists of 12 items (paper IV, Table 6) and uses a four-point scale from 1=never/not at all to 4=very often/very much during the last month. The inter-rater reliability for this subscale was found to be satisfactory (Kappa=0.90), test-retest reliability (0.84) and split-half reliability (0.73) (128). The

sum of scores was calculated for the whole sub-scale, range (12-48). Higher scores reflect lower levels of adjustment or more negative attitudes (128). As the majority of women have a very positive experience of motherhood (86, 101) and there is no established cut-off for the measure of adjustment and attitude to motherhood and the baby, we defined as having a less favourable adjustment to motherhood, those women who scored in the top 25% (upper quartile). Women scoring $\geq$ 23 p at 3 months or $\geq$ 22 p at 18 months were considered to have had a less favourable adjustment to motherhood. Items were also analysed separately in order to get a more comprehensive understanding of maternal adjustment and attitude.

The questionnaire was translated into Swedish by the research team and then retranslated into English by a professional translator.

Questionnaire for psychosocial information: At the final assessment a questionnaire was distributed pertaining to marital status and whether the women had had psychiatric problems post partum and if so what kind of help they had received.

Statistical analyses

An overview of methods, outcome variables and statistics in studies I and II is presented in Table 2.

Table 2. Overview of methods, independent variables, statistics and outcome paper I – IV.

	Methods and independent variables	Outcome	Statistics
Paper I - *phase 1* - *phase 2*	Review of WBC records EPDS RDC interview	Identification of postnatal depression Depressive symptoms Psychiatric diagnoses	Descriptive, Student's t-test Chi-square test Mann-Whitney U-test
Paper II	Interview (at inclusion) regarding psychiatric history and socio-demographic data SCL –90, SCID screen and GAF (during pregnancy, 3 and 18 months post partum)	Psychiatric history GSI-score Psychiatric caseness Personality disorders Global level of functioning	Student's t-test One-way analysis ANOVA Repeated measurement ANOVA McNemar's test Bonferroni method Multiple stepwise regression Pearson's correlation Spearman's rank correlation
Paper III	Interview (at inclusion) regarding psychiatric history and sociodemographic data SCL –90 (during pregnancy) SCID screen and GAF (during pregnancy) VAS Review of obstetrical and neonatal medical records	Childbirth experiences Obstetric and neonatal outcome	Mann-Whitney U-test Kruskal-Wallis one-way analysis Bonferroni method Logistic stepwise regression Spearman´s rank correlation Student's t-test One way analysis ANOVA Chi-square statistics Fisher´s exact test
Paper IV	Interview (at inclusion) regarding psychiatric history and sociodemographic data SCL –90, SCID screen and GAF (during pregnancy, 3 and 18 months post partum) Global Experience of Birth Obstetric and neonatal outcome MAMA (3 and 18 months post partum) Questionnaire for psychosocial information (18 months post partum)	Maternal adjustment and attitude to her child at 3 and 18 months post partum	see above paper III

In paper I data were processed with StatView 4.12 software for Macintosh and, in papers II-IV, with the SPSS 11.1 software for Macintosh.

ETHICS

In the retrospective part of study I, the women were not informed inasmuch the data were collected anonymously. In phase 2 the women were informed of the purpose of the study by the nurses at the WBC and in a letter from the authors before answering the EPDS questionnaire.

In study II the women were informed both personally by the authors and by a letter with information on the purpose of the study. The women were also informed of the fact that it was an observation study. They were given the opportunity to contact the authors for further information if necessary. The postpartum questionnaires were sent by post and, if not returned within two weeks, a reminding letter was sent, and after another week an additional letter was sent and, finally, the women received a reminding phone-call.

Unfortunately, there was no administrative possibility to obtain information concerning stillbirths in time to prevent us from sending questionnaires regarding the women's childbirth experiences. This is an ethical dilemma in large studies with an emphasis on getting early information, as problems arises regarding the possibility of receiving early notification of complications. As information regarding the tragical outcome came to our knowledge, we personally contacted the women and apologised. No woman expressed any feelings of being hurt by receiving the questionnaires. However, I believe that any possible negative feelings might be reduced if the women are contacted personally and are thereby given the opportunity to talk about their experiences. This also applies to women who have given birth to severely ill or handicapped children. None of the women who had had severely ill children in the study interrupted their participation. Women who expressed suicidal thoughts in the questionnaires were also contacted by the authors and recommended to get in touch with the psychologist at the ANC or WBC or the psychiatric outpatient clinic.

Approval of the studies was obtained from the Ethics Committee of the Huddinge University Hospital, namely study I (Dnr 92/307) and study II (Dnr 183/96).

RESULTS

Paper I

Occurrence rate of depression in the retrospective study

Two per cent (27/1128) of the mothers were identified as depressed in the routine service of the WBC during the first three months post partum. Three more cases of depression were identified during the following three months.

Demographic data on the EPDS sample

Twenty-six per cent of the EPDS sample was of non-Swedish nationality. One out of five immigrants came from other Nordic countries and 36% from other parts of Europe. The remaining number of immigrants came from different countries in the Middle East, Asia, Africa and Latin America. The mean age was 28.2 (SD $\pm$5) years and 94% of the women were married/cohabiting at the time of the first visit to the WBC. Fourty-six percent of the women were first-time mothers, 34% were para-II, 16% para-III and 4% were para-IV-VI.

Prevalence of PND according to EPDS

During the project year (phase 2), a total of 45 out of 309 women (14.5%) scored > 12 on the EPDS. The high scorers were more frequently single ($P<0.001$) and less often primiparae ($P<0.05$). No statistical difference was noted in age between high and low scorers on the EPDS or between Swedish and immigrant mothers regarding the proportion of high scorers. However, the immigrant mothers scored, on the average, higher than the Swedish mothers on the EPDS (8.5 vs. 6.9; $P=0.01$).

RDC diagnoses

A total of 39 out of the 45 high scorers were interviewed. Six women (13%) declined to participate or were not interviewed for various reasons. Table 3 shows the diagnostic panorama according to RDC.

Table 3. Diagnoses (RDC) (n=39)

Diagnosis	Number
Major depressive disorder	1
Minor depressive disorder	18
Probable minor depressive disorder	7
Phobic disorder	1
Unspecified functional psychosis	1
Other psychiatric disorder (anorexia)	1
No psychiatric disorder	10
Total	*39*

Table 4. Background data for the total sample (n=625) in relation to the Global Severity Index (GSI) of the SCL-90 measured during pregnancy.

	No	(%)	GSI mean score	(SD)	Test value	P value
Age[1] , Mean (SD): 27.2(4.4) years					r=-0.27	<0.01
SES						
Long-term unemployed[2]	43	(7)	0.69	(0.60)		
Workers	195	(31)	0.46	(0.37)		
Students on post-secondary school level	24	(4)	0.36	(0.26)		
Nonmanualemployes/ professionals	357	(57)	0.30	(0.25)		
Loss of data	6	(1)			F=24.2, df=3	<0.001
Nationality (Country of birth)						
Sweden	564	(90)	0.38	(0.35)		
Other Nordic countries	18	(3)	0.31	(0.22)		
Other European countries	16	(3)	0.41	(0.27)		
Non-European countries	27	(4)	0.56	(0.43)	F=2.7, df=3	0.045
Marital status						
Married/cohabiting	588	(94)	0.38	(0.35)		
Single with steady partner	22	(4)	0.47	(0.26)		
Single	15	(2)	0.57	(0.54)	F=2.9, df=2	0.055
Personality disorder						
Yes	40	(6.4)	0.99	(0.61)		
No	584	(93.6)	0.34	(0.27)	t=-12.8,df=622	<0.001
Psychiatric/psychological treatment (during childhood, <18 yrs of age)						
Yes	47	(8)	0.60	(0.54)		
No	578	(92)	0.37	(0.32)	t=-4.6, df=623	<0.001
Psychiatric/psychological treatment (as an adult)						
Yes	75	(12)	0.50	(0.40)		
No	550	(88)	0.37	(0.34)	t=-2.7, df=623	0.007
Psychiatric/psychological treatment (current)						
Yes	17	(3)	0.66	(0.50)		
No	608	(97)	0.38	(0.34)	t=-3.3, df=623	0.001
Smoking status						
Non-smoker	558	(89)	0.37	(0.33)		
1-9 cigarettes/day	39	(6)	0.40	(0.27)		
≥10 cigarettes/day	27	(4)	0.64	(0.63)		
Loss of data	1				F=7.8, df=2	<0.001
Alcohol consumption						
Seldom/never	619	(99)	0.38	(0.35)		
≤once a week	6	(1)	0.38	(0.38)		
>once a week	0					ns
Spontaneous abortion						
None	542	(87)	0.39	(0.31)		
One	73	(12)	0.34	(0.23)		
≥Two	10	(1)	0.52	(0.31)		ns
Induced abortion						
None	485	(78)	0.37	(0.32)		
One	118	(19)	0.45	(0.44)		
≥Two	22	(3)	0.41	(0.33)	F=2.92, df=2	0.055
Total sample	*625*		*0.38*	*(0.35)*		

[1]Pearson's correlation analyses. [2] Including women involved in educational programmes for adults.

In all, 67% (26/39) of the high scorers had an RDC depression. In other words, at least 8.4% (26/309) of the investigated mothers had a clinical depression. In the total group of high scorers 62% reported marital problems and 46% reported previous psychological problems, four women reported previous suicide attempts. Only one woman, however, reported having been admitted to a psychiatric clinic.

Paper II

Personality disorder, sociodemographic variables and health-related factors in relation to the Global Severity Index (GSI) score of the SCL –90 as measured during pregnancy

The prevalence rate of PD during pregnancy was 6.4% (40/625). Background data and the results of the bivariate analyses are presented in Table 4.

The independent variables significantly associated with the GSI score during pregnancy were entered in a multiple regression analysis performed with the GSI score as the dependent variable. Significant predictors for a high GSI score during pregnancy were: having a PD (t=10.6, P<0.001), younger age (t=-4.3, P<0.001), being a worker (t=3.1, P=0.002), long-term unemployment (t=3.4, P=0.001), being born in a non-European country (t=2.1, P=0.035) and previous and current psychiatric/psychological treatment as an adult (t=2.4, P=0.016 and t=2.9, P=0.004, respectively). The seven variables in the final model explained 29% of the variance in the GSI score.

Table 5 shows the results of an ANOVA with repeated measurements with respect to the GSI score by time and relevant psychiatric and sociodemographic factors. No significant interaction was found between the time factor (during pregnancy and 3 and 18 months following childbirth) and the different independent variables considered (Table 5). The strongest factor predicting the GSI score at all three assessments was having a PD (F=143.2; P<0.001); see also Figure 1.

Table 5. ANOVA with repeated measurements (n=582) with respect to GSI score with regard to time (during pregnancy, three and 18 months postpartum), psychiatric factors and relevant sociodemographic factors.

Source of variation	*Mean Square*	*Df*	*F*	*P*
Time (repeated)	0.2	2	5.0	0.007
Age	1.7	1	9.7	0.002
Personality disorder	25.5	1	143.2	<0.001
Previous psychiatric/psychological treatment (as adult)	1.2	1	7.0	0.009
Current psychiatric/psychological treatment	1.3	1	7.3	0.007
Long-term unemployed	3.8	1	21.1	<0.001
Worker	0.7	1	3.7	0.054

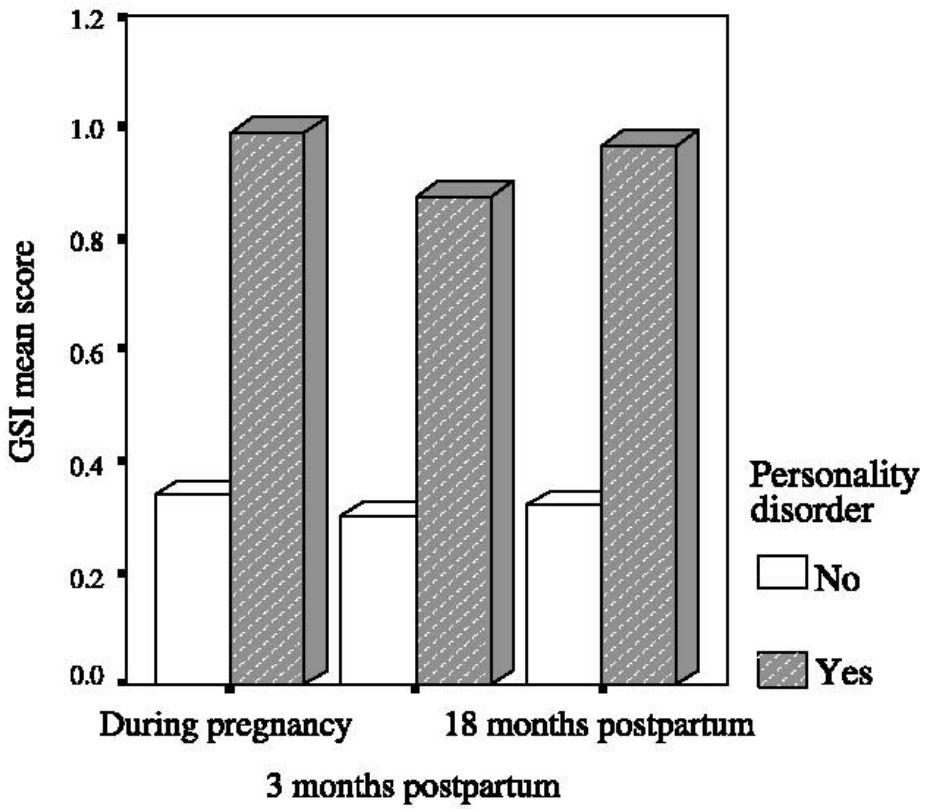


Fig. 1. Mean GSI score for women with and without PDs

SCL-90 scores on the different subscales

The mean GSI score varied between the assessment occasions (F=5.0; P=0.007), see paper II, Table 4. The highest scores were found on the subscales measuring somatisation, depression and obsessive-compulsive symptoms. Symptoms of somatisation varied significantly during the observation period with the highest mean score (SD) during pregnancy, and the lowest one three months post partum (0.54 (0.48) vs 0.33 (0.36)).

Psychiatric caseness: course and association with PD

No significant difference was found in the prevalence of psychiatric cases, as defined in this study, during pregnancy and 3 or 18 months following delivery, i.e. 7.5% (47/625) vs. 5.9% (36/606) and 8% (47/587), respectively. The mean GSI scores (SD) in the psychiatric case groups on the three assessment occasions were 1.3 (0.39), 1.2 (0.35) and 1.3 (0.36).

A highly significant association (rho=0.36, P< 0.001) was found between caseness in pregnancy and three months post partum: 16 women (34%) among the 47 antepartum cases were also cases three months post partum compared with only 20 (3.5%) of the

578 non-cases during pregnancy. The rate of new cases at the assessments at three months and 1.5 years following childbirth was 56% and 51%, respectively.

In all, 40.4% (19/47) of the women defined as psychiatric cases during pregnancy were also diagnosed as having a PD. Twenty-one per cent (10/47) of the women defined as cases during pregnancy were still cases at 18 months following childbirth. Seven of these 10 cases (70%) also met the criteria for a PD.

Psychological or psychiatric treatment during pregnancy and the post partum period

In total, 17 (3%) women out of 625 reported that they had received psychiatric/ psychological treatment during pregnancy up to the time of inclusion. Of the women defined as psychiatric cases during pregnancy, 14.8 per cent (7/47) received psychiatric/psychological treatment during pregnancy (up to the time of inclusion). During the 18 months following childbirth, six per cent (35/587) of all women had received psychiatric/psychological treatment: one woman reported inpatient care, five received a combination of pharmacological and verbal therapy while 29 had received verbal therapy only.

Paper III

Mental health in relation to experiences during labour and GEB

No significant differences were found between the groups of non-case/non-PD, PD and case as regards GEB. No associations were found between the psychosocial factors studied and GEB (paper III, Table 1). Women defined as psychiatric cases during pregnancy were significantly more anxious (P=0.01) during labour than those in the non-case/non-PD group. No differences were found between the three mental health groups regarding such experiences during labour as perceived pain, support of the partner and staff and satisfaction with pain relief or trust in staff (paper III, Table 4). All questions were correlated with GEB (P<0.01). Pain during childbirth showed the strongest correlation with GEB (rho = 0.54, rho^2 = 0.30), which means that pain shares a 30% common variance with GEB. The weakest correlation was noted between perceived support from the partner and GEB (rho=0.17, rho^2=0.03). Women treated with an elective Caesarean section were excluded from the analysis.

Mental health in relation to obstetric outcome

No significant differences were found between the three groups regarding the use of EDA or any other obstetric outcome variables. Owing to small numbers, it was not possible to compare the three groups of mental health regarding associations between mode of delivery and GEB.

Pregnancy, birth and neonatal data in relation to GEB

For an overview of the distribution of pregnancy, birth and neonatal data significantly associated with GEB, see paper III, Table 2. No associations were found between GEB

and length of gestation, earlier infertility, abortions, bleeding during labour or gender of the child. In total, 75 children (12.1%) were referred to a neonatal ward (mean duration of stay 11 days, SD 13.6, md 4, range 1–74).

Multivariate analyses

According to the logistic regression analysis comprising all women with GEB as the dependent variable, the strongest predictors for a negative GEB were to have been instrumentally vaginally delivered (OR 3.2, 95% CI 2.0-5.0). There was also a tendency for women who were delivered by emergency Caesarean section (OR 1.8, 95% CI 1.0-3.4) to have a more negative birth experience than women with a spontaneous delivery. Having received EDA was also a strong predictor of a negative birth experience (OR 2.4, 95% CI 1.5-3.9). The childbirth experiences of the women's own mothers were found to be of importance for having a negative birth experience. The likelihood increased if the women's mothers had reported difficulties (OR 1.8, 95% CI 1.1-3.0) or if the woman had uncertain or no information about her mothers' childbirth experiences (OR 1.9, 95% CI 1.2-3.0).

Paper IV

Mental health and sociodemographic characteristics

In all 40 (6.4%) of the 624 women satisfied the criteria for PDs during pregnancy and 28 out of 625 (4.5%) were defined as probable psychiatric cases without PDs. The total number and the panorama of PDs are presented in Table 6.

Table 6. The prevalence of various personality disorders (PDs) during pregnancy among primiparous women (*n=624*).

Personality disorder[1]	n	(%)
Cluster A	*23*	*(57.5)*
Paranoid	19	(3.0)
Schizotypal	3	(0.5)
Schizoid	1	(0.2)
Cluster B	*38*	*(95.0)*
Histrionic	11	(1.8)
Narcissistic	9	(1.4)
Boarderline	17	(2.7)
Antisocial	1	(0.2)
Cluster C	*39*	*(97.5)*
Avoidant	14	(2.2)
Dependent	4	(0.6)
Obsessive-compulsive	10	(1.6)
Passive-aggressive	9	(1.4)
Self-defeating	2	(0.3)
Any personality disorders	*40*	*(6.4)*
One	18	(2.8)
Two	7	(1.1)
≥Three	15	(2.4)

[1]The women could satisfy the criteria for more than one PD.

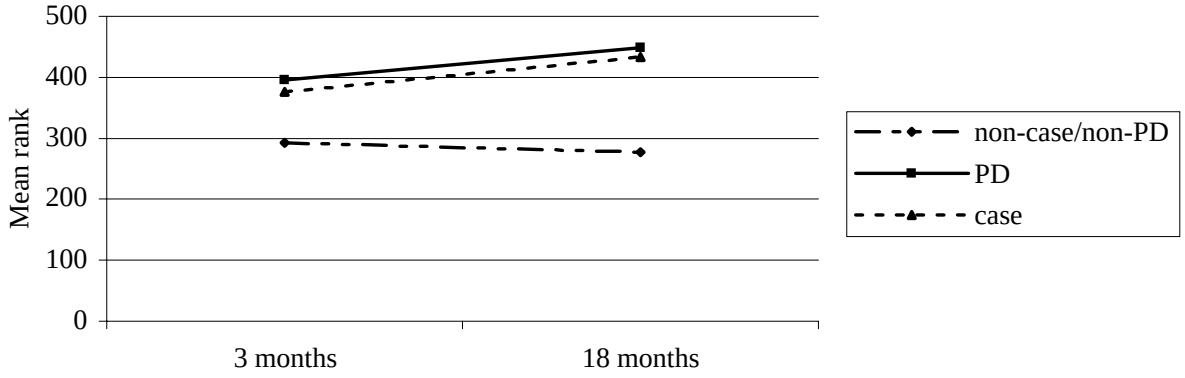
The sociodemographic characteristics in the three groups of non-case/non-PD, PD and psychiatric cases of women were compared and the results are presented in Table 7.

Mental health, psychosocial and birth related factors in relation to the MAMA questionnaire ratings

The results of the bivariate analyses of the background factors significantly associated with maternal adjustment and attitudes at three and/or 18 months post partum are presented in paper IV, Table 3.

Women with PDs as well as women defined as psychiatric cases scored higher (less favourable adjustment) than the non-case/non-PD group at the MAMA questionnaire at both assessments (Figure 2).

Figure 2. MAMA questionnaire ratings at three and 18 months post partum in relation to mental health during pregnancy



Multivariate analyses

The final model of the logistic regression analysis showed the following variables to be the strongest predictors for a less favourable adjustment to motherhood at three months post partum: to concurrent meet the criteria for a PD (OR 6.1, 95% CI 2.9-12.5) and psychiatric caseness (OR 5.5, 95% CI 2.2-13.9). To be single during pregnancy (OR 2.3, 95% CI 1.1-5.1) and to have had a negative birth experience (OR 1.9, 95% CI 1.2-2.9) also increased the likelihood of a less favourable adjustment to motherhood.

At 18 months post partum the final model of the logistic regression analysis showed the following variables to be the strongest predictors of a less favourable adjustment to motherhood: to have multiple births (OR 5.9, 95% CI 1.7-20.8), psychiatric caseness

during pregnancy (OR 5.0, 95 % CI 2.0-12.5), meeting the criteria for PDs during pregnancy (OR 3.5, 95 % CI 1.5-8.5) and meeting the criteria for a PD at 18 months (OR 3.4, 95 % CI 1.6-7.1). To be single at 18 months post partum also increased the likelihood of a less favourable adjustment to motherhood (OR 2.4, 95 % CI 1.1-5.0). No significant effects of interaction could be found between the groups of non-case/non-PD, PDs and cases and negative GEB as regards the MAMA questionnaire ratings.

Mental health during pregnancy and GEB in relation to the different items of the MAMA questionnaire

On studying the specific items in the MAMA questionnaire, a pattern of different answers emerged (paper IV, Table 6). At the three-month assessment, women with PDs had a significantly higher mean rank (less favourable adjustment) in six out of 12 items and women defined as psychiatric cases in two out of 12 items compared to the non-case/non-PD group women. At the 18-month assessment, women with PDs had a significantly higher mean rank than those in the non-case/non-PD group regarding 11 out of 12 items. Women defined as psychiatric cases had a significantly higher mean rank regarding six out of 12 items compared to the non-case/non-PD group. There were, however, no significant differences between the groups of PDs and psychiatric cases. Women with a negative GEB had a significantly higher mean rank than women with a positive GEB regarding 8 items at three months and regarding four items at 18 months post partum.

DISCUSSION

Methodological considerations

This thesis is based on two studies and has the advantage of being population-based and comprising consecutively included women. Few women declined to participate and in study II, which was a longitudinal study, there was a low attrition rate.

From a methodological point of view, in study I (paper I), we have to consider that the depression rates based on the charts and the nurses' memory of identified depressed mothers was compared to depression rates based on a self-rating scale. However, considering that all the women were well-known to the nurses, who had ongoing contacts with them, it is reasonable to assume that the nurse in question, based on her own case-notes, should remember whether she had identified a mother as depressed or not.

A prospective and longitudinal design of study II (papers II–IV) reduced the bias of memories affected by concurrent mental problems accompanied by low self-esteem and self-confidence. This was an important matter of concern, especially as regards experiences of childbirth and motherhood. A weakness of the study was that despite the original sample size of 625 women, we ended up with rather small samples of women with PDs or defined as psychiatric cases.

Health-related information such as alcohol consumption and smoking habits were collected from the antenatal ward records (paper II). However, very few women, n=6(1%), admitted alcohol consumption during pregnancy. Due to small numbers, these variables were not included in the analyses in papers III and IV. Smoking (136) and alcohol consumption (137) are known to be under-reported during pregnancy.

Finally, another limitation of the present studies was that only Swedish-speaking women, were included. The studies give no information on mental health of childbearing immigrants who are less integrated in Swedish society.

Postnatal depression among childbearing women - Study I

One of the main findings of this study was that only 2% of the mothers were identified as depressed three months post partum by the nurses in the routine service of the WBC in the southern Stockholm region. This finding confirms the results of a study conducted in southern Sweden (44) reporting that the WBC health visitors identified 4.7% of the mothers as depressed during the *first year* post partum. When screened with the EPDS, 14.5% of the mothers in the same area in Stockholm reported depressive symptoms. These results imply, firstly, that the depression rate in newly delivered women in the area is similar to the expected prevalence rate of 10-15% reported in other

studies (4, 16, 26), secondly, we found that postpartum depression is still a hidden illness.

In an earlier Swedish study on PND (52) conducted in an area north of Stockholm, 7% of the women scored >12 on the EPDS. The substantially lower depression rate might have been due to sociodemographic factors. Compared to the relatively stable rural and suburban Swedish population studied by Lund & Gyllang (52), the present one could be described as multiethnic (26% immigrants) and the community generally being more socially disadvantaged. Another possible explanation could have been the economic recession in Sweden, which could have contributed to a higher rate of depression in mothers in 1994 than in 1988. In a large community-based study conducted in Gothenburg, the second largest city in Sweden, Wickberg & Hwang (138) reported a prevalence rate of PND of 8.3%. But a slightly lower cut-off score (11/12) was used in their study.

In total, 67% of the women scoring above the cut-off on the EPDS in our study had a clinical depression according to the RDC criteria. This finding confirmed the results of earlier studies on the validity of the EPDS reporting an identical (66) or similar (64-73%) (50, 139, 140) positive predictive value for postnatal depression.

We found that at least 8.4% of the investigated mothers had a clinical depression according to RDC. This rate must be regarded as a minimum as we do not know the the rate of false negatives in the group of women scoring ≤12 on the EPDS. Consistent with earlier studies (21, 24, 26), the majority of the PND mothers did meet the criteria for minor but not for major depression. It was clinically striking that these women were distressed and in need of help. Six out of 10 women with depressive symptoms reported marital conflict.

In agreement with Wickberg & Hwang (138), but contrary to most other reports (141), we found a positive link between being single and postnatal depression. In line with Brown & Harris (142), we found that the depressed women were more often single with more than one child. Our study points in the same direction as that of Paykel et al. (143), emphasising that life stress and an absence of social support are important factors in the development of postpartum depression.

Development in the field of postnatal/postpartum depression

Since this study was conducted, the number of published studies regarding this subject has greatly increased (15). With a simple search in PubMed, I have found more than 1100 studies on postpartum depression during the years from 1995 to 2005. A meta-analysis of 59 studies found the prevalence rate of postpartum depression to be 14% if self-report questionnaires were used, and 12% according to interview studies (19). Two large studies using the EPDS as a screening tool of postpartum depression have been

conducted in Sweden (144, 145). The prevalence rate of depressive symptoms two months post partum was found to be 11.1% with a cut-off of ≥ 12 points (144), and 13% if a cut-off ≥ 10 p (145) was used. Both studies also demonstrated an association between depression during pregnancy and post partum.

Professionals tend to under-diagnose depression (43, 46, 47, 146) and women also hesitate to seek help (43, 54). In accord with the results of our study, other researchers (15, 46, 47, 54, 147) have found EPDS used as a screening tool to improve the identification of postpartum depression in clinical settings. Consequently, many researchers in perinatal psychiatry (15, 46, 54) advocate implementation of screening programmes for antepartum as well as postpartum depression. Educational programmes for professionals working with childbearing women and screening procedures are now being established and recommended in countries such as Sweden (148), Great Britain (149) and Australia (54).

Other researchers claim that there is no evidence to support routine antenatal screening for postpartum depression (150, 151), as no intervention programmes have been found to be successful in preventing postpartum depression. The authors do not discuss the usefulness of screening procedures to identify current depression in women. However, there is a distinction between "who is at risk of *becoming* depressed" and "who is depressed *at present* ". Preventive interventions are problematic due to the complexity of biological and psychosocial risk factors for depression (152). However, as depression is found to be associated with stressful events and negative psychosocial life contexts for women (153), we need to identify women with current depression in order to offer individualised support and treatment.

Prevalence of personality disorders during pregnancy in study II

The present study is the first one to include PDs according to the DSM system as an explanatory factor in addition to sociodemographic and health-related factors in the mental ill-health of childbearing women (paper II) as well as for experiences of child-birth (paper III) and motherhood (paper IV).

The prevalence rate (6.4%) of any PDs during pregnancy in the present study was lower than reported among women in two other Scandinavian studies of the general population (39, 40) but about the same as among young women in the study of secondary students in Finland (38). However, our sample of primiparous women is probably not entirely representative of the general population. The very nature of PDs implies difficulties in interpersonal relationships. The women in our sample had established a relationship and they were all willing to give birth to a child. In all, 96% of the women were married or cohabiting at inclusion in the study, compared to 65% in the general population of Swedish women of the same age (154).

Personality disorder, sociodemographic variables and health-related factors in relation to psychiatric symptoms

In line with our hypothesis, the present study showed a striking significance of PD for predicting high GSI score. The women with a PD had a mean GSI score (SD) (0.99 (0.61)), that was above the cut-off for psychiatric caseness. However, during an episode of depression and anxiety, patients tend to describe themselves as having more abnormal personality traits than during periods of remission (71, 155), which calls for caution in the interpretation of the present finding.

Our finding of an association between younger age and more psychiatric symptoms is in agreement with studies by Gotlib et al. (156) and Paarlberg et al. (157) but contradictory to a study by Zuckerman et al. (158) which showed the opposite. On the other hand, Bolton et al. found no association between depressive symptoms and age (159).

We found a significant difference in the psychiatric symptom load between the different SES groups, with the highest scores in the groups of long-term unemployed persons, including those involved in educational programmes for adults ($P<0.001$) and women with occupations requiring shorter periods of education (workers) ($P=0.054$). This is in agreement with researchers reporting higher rates of depression or depressive symptoms during pregnancy in women in lower social classes (160), in women with less education (157, 159, 161) and for unemployed women (158, 159). Hobfoll et al. found about twice the rate of depression during pregnancy as well as post partum in their financially impoverished, inner-city US sample compared to that found in middle-class samples (162). In a meta-analysis, O'Hara & Swain (19) conclude that low social status has a slight, but significant, predictive relation to postpartum depression. However, other authors have not found any association between low SES and depression post partum. Martin et al. (163) found an association between low SES and antepartum depression but no association with postpartum depression, implying different aetiologies for ante- and postpartum depression. In another Swedish study, no association was found between low SES during pregnancy and postpartum depression (164). These contradictory results might be explained by the complexities and varieties of the variables studied.

To be of non-European origin was a significant predictor for a higher GSI score during pregnancy. This agrees with the findings in a Swedish epidemiological study of depressive mood in pregnant women (165).

Contrary to several other studies (16, 47, 158, 159, 162, 163), marital status did not significantly influence the level of psychiatric symptoms in the present study. However, there were few women who were single during pregnancy in the sample, which resulted in low power to detect differences.

Previous treatment for mental problems was identified as a risk factor for mental illness during and after pregnancy in our study. This finding supports findings in many other studies (19, 26, 27, 158).

In the bivariate testing, there were two highly significant health-related factors, namely, smoking and treatment for mental problems during childhood, which proved to be non-significant in the further regression. The reason for this is that they share a common variance with the other covariates in the regression model, but this does not imply that they are not important. Smoking and alcohol consumption during pregnancy are well-known harmful factors for the foetus (136, 166), as well as for the woman. Smoking is known to be associated not only with low SES (136, 167, 168) but also with increased alcohol consumption (168). Hence, it is important to obtain a thorough anamnesis regarding alcohol consumption and smoking habits and to be aware of the association with depression (26, 160, 167).

The explained variance regarding the GSI score during pregnancy was 29% in the regression model, which is *per se* a fairly large amount of explained variance. On the other hand, 71% of the variance is explained by other factors than those included in our model, such as unplanned pregnancies and stressful life events (165).

In the present study, using repeated measurement statistics with respect to the GSI score in relation to the time factor (i.e. the different assessment occasions) and the different explanatory factors considered, no significant interaction could be found between the time factor and the explanatory factors. This finding is in line with a previous study conducted in Stockholm based on an in-patient sample of parapartum mentally ill mothers (29).

In accord with several studies (4, 21, 47, 145, 156, 169) based on self-report symptom rating scales, the present study shows higher scores in pregnancy than postnatally. However, in some other earlier studies (16, 26, 170) an increase in psychiatric disorders in the postpartum period has been reported. The level of psychiatric symptomatology 18 months following childbirth was higher that at three months post partum.

The number of psychiatric cases turned out, however, to be fairly consistent during the observation periods (7.5% vs.5.9% and 8%). The rate of psychiatric cases in the second trimester of pregnancy in this study (7.5%) was similar to the rate of 6% reported by Cooper et al. (18) as well as by Watson et al. (170). Kumar & Robson (26) reported a somewhat higher point prevalence of 11%. The prevalence of psychiatric cases three months after delivery in our study (5.9%) is close to the 8.7% reported by Cooper et al. (18), but lower than the rates reported by Kumar & Robson (26) and Watson el al. (170), who report 17% and 16%, respectively. It is likely that these inconsistencies are related to differences in methods of assessment and case definition (171). In the present

study, a rather conservative case definition was used in order to estimate a valid prevalence of probable psychiatric cases in the sample. This could explain the similarity to Cooper et al. (18), who used the Present State Examination (172), whereas the other two British studies (26, 170) used the Standardised Psychiatric Interview (SPI) (173), which is a less conservative case-finding instrument (18). No direct comparison with other studies is possible regarding the assessment at 18 months following childbirth. However, in the study by Kumar & Robson (26), it could be noted that the prevalence of neurotic disturbance was similar at one year after childbirth to the assessment at four years.

Women defined as psychiatric cases scored highest on the depression subscale of SCL-90 at all three assessments. This is in accord with the study by Cooper et al. (18), who found that virtually all symptoms in women defined as psychiatric cases in their puerperal sample were depressive or anxiety, as are the symptoms of caseness in the general population. Wisner et al. (25) found no differences between the symptomatology of affective disorder among childbearing women and non-childbearing women. It can be concluded that the symptomatology of psychiatric illness in childbearing women seems to be similar to that of non-childbearing women. Symptoms of somatisation in our sample varied significantly between the three assessments. The highest mean score was found during pregnancy. However, this subscale reflects distress arising from perceptions of bodily dysfunction (59), which is a predominant experience of pregnancy.

In line with several studies (47, 161, 174) but contrary to others (8, 26), we found a strong association between caseness during pregnancy and three months post partum. Our finding underlines the importance of intensified efforts to identify women who already have mental problems during pregnancy in order to provide adequate treatment, which can include pharmacological, psychotherapeutic as well as social interventions.

Approximately 40% of the women defined as psychiatric cases during pregnancy were also diagnosed as having a PD. Twenty-one per cent (n=10) of the psychiatric cases defined during pregnancy continued to be ‘cases’ throughout the observation period and 70% of these cases also satisfied the criteria for a PD. Having a PD was not only an important predictor of mental ill-health during pregnancy, but also a significant factor for predicting a long-lasting course of the mental problems.

Mental illness during pregnancy and childbirth experiences

Contrary to our expectations, we found no association between personality disorder and GEB, but a positive association between perceived anxiety during labour and GEB. This is consistent with Waldenström (80), who found situational anxiety during labour associated with a negative birth experience whereas anxiety as a personality trait measured during pregnancy was not. Although women defined as psychiatric cases were

significantly more anxious during labour than women without mental problems, we found no association between caseness and the global experience of childbirth. A possible explanation of this discrepancy might be that our groups were too small to detect a difference. However, given the small numbers of women in the groups of personality disorders and cases in our study these findings need to be replicated. Another possible explanation of our finding of no differences between women with personality disorders or defined as psychiatric cases and women without mental problems regarding childbirth experiences might be the very high (about 90%) participation rate in antenatal classes of all groups. Psychological preparation, as well as a deeper knowledge of the physiological process of childbirth, reduces the risk of miscomprehension in the communication with midwives and other staff members. Our results are also in line with those of Bergant et al. (83), who found that psychiatric care prior to childbirth was of no importance for a "high childbirth burden".

The query regarding the women's global experience of childbirth was formulated as a question with a dimension of expectation. Mentally vulnerable women might have more negative expectations and found that the experience of giving birth was better than expected. This is, however, contradicted by other studies showing that negative expectations are associated with negative experiences (80, 82, 90, 95, 96).

In line with previous prospective studies by Perkin (175) and Wu et al (176) no association was found between PDs, psychiatric caseness and obstetric outcome. Perkin et al. (175) found no association between personality traits, anxiety or depression during pregnancy and obstetric complications except for a weak relationship between high anxiety and increased use of analgesia during the second stage of labour. In two review articles, the authors (177, 178) stress that the results of previous studies are ambiguous due to methodological difficulties in studying the relationship between anxiety and obstetric outcome. Their criticism concerns such issues as insufficiently defined obstetric outcome and retrospective design. However, our study was prospective and comprised primiparous women, and information regarding obstetric outcome was collected from standardised maternity ward records.

In accord with similar investigations (80-82), the present study indicates that women's experiences of childbirth are multidimensional and influenced by both physical and psychological factors. Having been instrumentally delivered was more negative than having been delivered by emergency Caesarean section when other factors were controlled for, which is in line with the studies by Bergant (83) and Waldenström (80). As expected (80, 81, 96, 179-182), all women rated pain during labour very high and 65% of the vaginally delivered women also received EDA. However, women who received EDA were also more likely to have a negative childbirth experience. Perhaps the women recalled their experience of pain before they were given EDA or, as some studies have shown, effective pain relief like EDA does not automatically result in a

more satisfying childbirth experience (183, 184). Waldenström et al. (96) have shown that pain is multidimensional and not entirely negative. Augmentation and a longer labour time increased the likelihood of a negative GEB. These factors were also strongly associated with EDA (185-188). Generally speaking, the use of EDA during labour and its importance for women's experiences of childbirth is difficult to interpret. Psychological stressors such as scalp blood samplings, a low Apgar score and transferral of the child to an antenatal ward were also of importance for a more negative childbirth experience.

Among women whose own mothers had had difficulties with their deliveries, the likelihood of having a negative global experience of childbirth increased, as well as when the woman had no information about her own mother's experiences. According to Raphael-Leff (100), this can be an expression of a less satisfactory contact between mother and daughter. The question concerning the woman's knowledge of her own mother's childbirth experiences was posed two weeks after delivery. Hence, we do not know if the mothers had been talking about their own experiences before the daughter's delivery or if they had confirmed their daughter's experiences. In a prospective study of primiparous women, Uddenberg et al. (97) collected information from mothers of pregnant daughters. They found a positive association between mothers and daughters regarding obstetric outcome. Melender (90) showed that negative stories told by others cause anxiety prior to childbirth as well as negative birth experiences. Experience of childbirth might be coloured by expectations based on what women have heard from their own mothers or inherited physical conditions (97). Both factors are probably of importance for women's experience of childbirth.

Mental illness, birth experiences and experience of motherhood

The results of the present part of the study confirm the assumptions that personality disorders as well as psychiatric caseness, mainly depression and anxiety disorders and negative birth experiences are all important factors in a woman's adjustment to motherhood and for her attitude to the baby.

Women with mental problems during pregnancy were less frequently non-manual employees than women without mental problems. Women with PDs were also younger and more often long-term unemployed than women without mental problems. This can be regarded as an expression of a more problematic psychosocial situation for women with PDs (39, 70, 73) as well as for psychiatric cases (70, 189). No difference was found between the groups regarding marital status during pregnancy. However, women with PDs, as well as women defined as probable psychiatric cases during pregnancy, were, to a significantly larger extent, single when their children were 18 months old compared to the non-case/non-PD group. The results are in line with those of Robinson et al. (60), who found that women with a high global severity index according to the SCL-90 during pregnancy not only had significantly less intimacy with their partner

during pregnancy, but also a significantly larger decrease in intimacy with their partner one year post partum compared to women in a low symptom group. To be single at 18 months also corresponds to a less favourable adjustment to motherhood in our study. Partner support as well as extrinsic support is important during this stressful time in life (101, 107). The reason for being single is multifaceted, and the problematic interpersonal functioning of individuals with PDs might be a contributing factor.

The main finding of the present study was that, contrary to women without mental problems during pregnancy, the process of adjustment to motherhood seems to be impaired in women with mental problems, as measured three and 18 months post partum. Our finding that mental problems during pregnancy are strong predictors of a less favourable maternal adjustment at 18 months post partum is interesting but somewhat difficult to interpret. However, our findings are in line with the results of earlier work by Davids et al. (105). They found a significant association between high manifest anxiety during pregnancy and dissatisfaction with motherhood at eight months post partum. A possible explanation for our results is that the process of attachment to the unborn child during pregnancy (99, 100) has been disturbed or not been properly established. Sjögren et al. (190) have shown that the process of attachment to the unborn child starts early on in pregnancy. In their recently published study (190), they found a negative correlation between psychic anxiety, emotional detachment and attachment to the foetus. The results of the present study are also in accord with Risholm-Mothander, who found that psychological and social well-being during late pregnancy was the strongest predictor for a positive maternal adjustment at 12 months post partum (191).

At 18 months post partum, the strongest predictor of a less favourable adjustment to motherhood was having had a multiple birth. Giving birth to twins or triplets follows a pregnancy with increased physical as well as psychological distress. It has been demonstrated that not only financial and practical demands complicate life with twins or triplets but also feelings of ambivalence, guilt and negative attitudes, accompanied by a general feeling of being overwhelmed (192).

Women with personality disorders and women defined as probable psychiatric cases at three months post partum had a less favourable adjustment to motherhood at the three-month assessment than women without mental problems or with mental problems during pregnancy. Concurrent mental illness at three months post partum may be more stressful for women than mental illness during a later period, as this point in time might be more practically demanding with breast-feeding problems as well as sleep deprivation. During the infancy period, it is also difficult to replace the mother, and this causes additional strain on her. Our findings are in line with those of Webster et al. (108) who found a strong correlation between high scores on the EPDS and the MAMA questionnaire. Women with depressive symptoms eight weeks post partum had a less

positive experience of motherhood and a less positive attitude towards their infants. A negative impact of early postpartum depressive symptoms on the mother-child relationship at 18 months post partum has been demonstrated by several authors (111, 112, 193). According to Bor et al. (194), a negative maternal attitude towards the child and maternal depression during early infancy are independent predictors of children's behaviour at five years of age and they suggest that these results call for a broadening of the perspective of maternal affective disturbances and the negative consequences for children's development.

The MAMA questionnaire is designed specifically to investigate patterns of change in maternal adjustment (128). The different items can be considered to reflect different aspects of maternal adjustment and attitudes to the baby. There were no significant differences between the groups of PDs and cases as regards adjustment to motherhood. However, women with PDs during pregnancy had a higher mean rank regarding six out of 12 items at three months post partum and regarding 11 out of 12 items at 18 months than women without mental illness. Also women defined as psychiatric cases during pregnancy had a higher mean rank regarding more items at 18 months (six items) compared to three months (two items), than women without mental illness. Although caseness during pregnancy was the strongest predictor for less favourable adjustment to motherhood at 18 months, women with PDs seem to have problems regarding more aspects of motherhood than women defined as psychiatric cases. To become a mother for the first time is known to have a very significant effect on the woman's sense of identity (107) due to all the changes in her life. As women with PDs have a fragile sense of identity and self (69), this might be one of the key issues in the understanding of why women with PDs have problems in the adjustment to motherhood.

In contrast to Kumar (195), we did not find any interaction between PDs or psychiatric caseness during pregnancy and negative birth experiences regarding adjustment to motherhood at three or 18 months post partum. In other words, women with mental problems during pregnancy do not seem to be more vulnerable if they have had a negative birth experience regarding maternal adjustment than women without mental problems. Kumar found that postnatal mental illness and recalled severe pain during labour were significantly more likely to be associated with signs of dysfunctional maternal affection during the first year if they occur together. However, the retrospective design of their study might perhaps explain these results. Postnatal mental illness might have a negative impact on the memories of labour and delivery. The results of the present study indicate that the importance of a negative childbirth experience tends to diminish over time in women's adjustment to motherhood.

GENERAL CONCLUSIONS

I. Very few women with postnatal depression were identified in routine WBC care in Sweden. The use of a self-report questionnaire as EPDS was well accepted by the mothers as well as by the nurses and significantly increased the number of identified cases of postnatal depression. To be single and to be multiparous were significantly associated with high a EPDS score. Marital problems and previous psychological problems were common among women with high EPDS scores.

II. The prevalence rate of personality disorders was found to be 6.4% among childbearing women. Personality disorder was found to be strongly associated with psychiatric symptoms during and after pregnancy and a significant factor in predicting a long-lasting course of mental problems. A strong association was found between psychiatric symptoms during pregnancy and three months post partum. Childbearing women with mental problems were also a socially disadvantaged group.

III. Contrary to our expectations we found no association between personality disorders or psychiatric caseness during pregnancy and global experience of birth. However, due to the small sample size of mentally ill women the findings have to be interpreted with caution. The present study also demonstrates a negative impact of instrumental delivery, emergency Caesarean section and need of EDA for women's experiences of childbirth.

IV. For most women in our study the process of adjustment to motherhood was improved. However, the opposite was found for women with mental illness during pregnancy. Women suffering from personality disorders seem to have problems regarding more aspects of motherhood than women defined as psychiatric cases during pregnancy. Multiple births were also strongly associated with a negative experience of motherhood when the children were 18 months old. A negative birth experience was associated with a less favourable adjustment to motherhood when the children were three months old, but the importance tends to diminish over time.

CLINICAL IMPLICATIONS

Very few women with PND are identified in routine WBC care in Sweden. This fact underlines the need for proper history taking during the first visit to the ANC and WBC regarding previous and current mental health problems in childbearing women as well as new mothers. The use of EPDS as a screening measure for postnatal depression at the WBCs is recommended.

Professionals in contact with childbearing women should be aware of the strong association between deviant personality characteristics and psychiatric illness as well as the potential negative impact of mental illness on the experience of motherhood. Women at risk of mental illness post partum and a less favourable adjustment to motherhood can already be identified during pregnancy.

It is urgent to pay attention to women who are instrumentally delivered, as it was the strongest predictor of a negative birth experience. These women are therefore in need of extra support as well as women who are delivered by emergency Caesarean section. To have received EDA does not automatically result in a more satisfying childbirth experience. Women with psychiatric symptoms during pregnancy are in need of extra support during labour due to a higher level of anxiety.

Women at risk of a less favourable adjustment to motherhood can already be identified at the ANC during pregnancy. In order to minimise the adverse effects of mental health problems on the mother herself and her family, early identification is crucial. Regular collaboration with professionals such as child health care nurses, psychologists, psychiatrists and social workers, are important in order to offer individualised support and treatment

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