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Malin Eberhard-Gran · Kristian Tambs · Stein Opjordsmoen · Anders Skrondal · Anne Eskild

A comparison of anxiety and depressive symptomatology in postpartum and non-postpartum mothers

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Abstract *Background* The aim of the study was to compare the distribution of symptoms of anxiety and depression among postpartum as compared with non-postpartum mothers, and to estimate the impact of the postpartum period on the risk of anxiety and depression when adjusted for other risk factors. *Methods* A questionnaire survey approaching all women 18–40 years of age in two municipalities in Norway during the period 1998–1999 was conducted. A total of 2,730 women were included, of whom 416 were in the postpartum period. Only women with one or more deliveries ($n = 1,794$) were included in the multivariate analyses. *Results* The crude prevalence of anxiety and depression was lower in postpartum as compared to non-postpartum mothers. However, when controlling for other risk factors, the odds ratio for anxiety was 1.2 (95% CI: 0.6–2.3) and for depression 1.8 (95% CI: 1.1–2.9) during the postpartum period. *Conclusion* The overall risk of anxiety appeared to be the same in both groups, whereas the risk of depression was increased in the postpartum group.

Key words postpartum depression – prevalence – epidemiology – risk factors – reproduction

M. Eberhard-Gran, MD, PhD (✉) · K. Tambs, PhD · A. Skrondal, PhD
· A. Eskild, MD, PhD
Division of Epidemiology
Norwegian Institute of Public Health
Post Box 4404 Nydalen
0403 Oslo, Norway
Tel.: +47-23/408-233
Fax: +47-23/408-252
E-Mail: malin.eberhard-gran@fhi.no

S. Opjordsmoen, MD, PhD
Dept. of Psychiatry
Ullevål University Hospital
Oslo, Norway

A. Eskild, MD, PhD
Dept. of Gynaecology & Obstetrics
Ullevål University Hospital
Oslo, Norway

Introduction

Postpartum depression is not defined as a separate entity in the two major international classification systems, the ICD-10 or the DSM-IV (World Health Organization 1992; American Psychiatric Association 1994). It is assumed that depression in the postpartum period does not differ qualitatively from depression during other periods in life (O'Hara and Zekoski 1988). However, postpartum depression is often used as a separate diagnosis in clinical settings. Postpartum depression has been described as atypical in nature with anxiety and irritability as prominent symptoms (Pitt 1968). Others have suggested that postpartum women diagnosed with depression experience less anxiety than non-postpartum women with depression (Whiffen and Gotlib 1993; Augusto et al. 1996). Prior research found no difference in the pattern of symptoms of depression during pregnancy and postpartum (Evans et al. 2001). Some investigators have compared the prevalence of anxiety and depression among women in the postpartum period with results estimated in other epidemiological studies of depression and found no essential differences (Cooper et al. 1988). To our knowledge, few studies with a control group from the same population have compared the prevalence of anxiety and depression among women in the postpartum period with time periods beyond pregnancy and postpartum (Whiffen and Gotlib 1993; Augusto et al. 1996). Such a comparison may be important for understanding the nature of depression after delivery.

The first aim of this study was to assess the distribution of symptoms and prevalence of anxiety and depression according to the Hopkins Symptom Check List (SCL-25) (Hesbacher et al. 1980; Winikur et al. 1984) among postpartum as compared with non-postpartum women. The second aim was to study the impact of the postpartum period on anxiety and depression when adjusted for other identified risk factors among women with at least one delivery.

Subjects and methods

Design

The study was a population-based cross-sectional questionnaire study.

Study population

The study population included all women 18–40 years of age ($n = 4,303$), of whom 485 women were in the postpartum period. All participants resided in two municipalities in Norway (Nes and Sørumsund), which are situated approximately 60 kilometers northeast of Oslo, the capital of Norway.

Postpartum women, recruitment and data collection

The postpartum women were identified through the community-based child health clinics. These clinics provide routine health controls for all children from birth through 6 years of age. Information on all births in the district are routinely reported by the maternity ward to the child health clinic in each district.

During the study period, from May 1998 until December 1999, a total number of 485 women gave birth to a live-born child (14 gave birth to twins), 481 of whom came to the child health clinic in their municipality 6 weeks after delivery. Of these, 14 were not included in the study for the following reasons: 6 did not speak or read Norwegian, 2 were younger than 18 years old (full legal age) and 6 did not receive the questionnaire by mistake. Of the remaining 467 women, 416 (89%) returned the questionnaire. The questionnaires, which were handed out by the child health clinics' nurses, were completed at home and returned by mail to the study administration.

The mean age of the postpartum women was 30.0 years (range 18–45 years; SD 4.8 years). A total of 42% were primiparous, and 407 women (98%) were married or living together with the child's father. In all, 77% reported vaginal deliveries, 12% caesarean section, and an additional 10% reported forceps or vacuum delivery. According to information from the child health clinics, the non-responders ($n = 51$) did not differ in mean age or in parity from the responders.

Non-postpartum women, recruitment and data collection

The study population of non-postpartum women was identified through the Person Registry of Norway. Postal questionnaires were mailed to the home address of all women between 18 and 40 years ($n = 4,303$) in the two municipalities. The questionnaires were sent in November 1998 ($n = 1,000$), February 1999 ($n = 1,000$), May 1999 ($n = 1,150$) and August 1999 ($n = 1,153$). Women were randomly selected to each seasonal group to avoid bias attributed to possible seasonal variation in the prevalence of depression and anxiety. The self-administered questionnaires were returned by mail to the study administration after completion.

Of the 4,303 women identified through the Person Registry, 182 had moved and did not receive the questionnaire. Of the remaining 4,121 women, 2,577 (63%) returned the questionnaire. The mean age was 30.6 years (range 18–41; SD 6.7). A total of 913 (33%) did not have any children and 31% were single. The non-responders did not differ significantly in age from the responders (mean 29.6 years; range 18–41; SD 6.8).

More than half of the postpartum women ($n = 263$) also returned the questionnaire as part of the data collection from all non-postpartum women. These 263 women were excluded from the non-postpartum sample, hence reducing this sample to 2,314 women. All women with a delivery during the study period were, thus, included in the postpartum study sample.

Variables

Measure of mental health

The Hopkins Symptom Check List 25-items version (SCL-25) (Hesbacher et al. 1980; Winikur et al. 1984) was included in the questionnaire. The SCL-25 is a self-rating scale with 25 items designed to measure symptoms of anxiety and depression (Table 1). Each item has four response categories ranging from 1 ("not at all") to 4 ("extremely"). The sum score ranges from 25 to 100. Each of the SCL-25 items was dichotomized and coded: 1 ("not at all") and 2 ("a little/quite a bit/extremely"). Missing values were substituted by mean values if less than four of the items were missing.

The SCL-25 includes separate scales for anxiety and depression. The sum of the first ten items gives the anxiety score (SCL-anxiety) and the sum of the last 15 items gives the depression score (SCL-depression). SCL-anxiety score ≥ 18 was used as the cut-off for anxiety and SCL-depression score ≥ 27 was used as the cut-off for depression. These cut-off levels correspond to the cut-off used in prior studies (Nettelbladt et al. 1993; Mathiesen et al. 1999).

Explanatory variables

Being in the postpartum period (yes/no) was the main explanatory variable.

The following potential confounding factors were included in the multivariate analyses:

1. Reproductive factors: number of children, history of spontaneous abortion, history of induced abortion, history of stillbirth, breastfeeding after last delivery, mode of last delivery, pelvic pain in last pregnancy and premenstrual tension. The question on premenstrual tension was: "Do you generally feel depressed or irritated before menstruation?" (coded: "no", "slightly" or "noticeable/very annoying").
2. Psychiatric history: History of depression including previous postpartum depression. Information on a history of depression was obtained by a scale constructed to measure lifetime history of major depression (based on the DSM-IV criteria) (Kendler et al. 1993). Prior depression was defined as having had at least three symptoms at the same time with a duration of at least 2 weeks.
3. Somatic disease: somatic disease during the last year. Information on somatic disease was obtained through a checklist of 15 different diseases. The diseases were: cardiovascular disease, high blood pressure, hyperthyroidism, asthma, hay fever/allergy, skin disease/eczema, muscular/skeletal/articular disease, kidney/urinary disease, fibromyalgia, gynecological disease, migraine, diabetes, gastrointestinal disease, cancer or other somatic disease not listed above. Somatic disease (yes/no) was defined as presence of one or more of the diseases listed above.
4. Life events: major life events during the last 12 months. Ten items were selected from established life event scales (Coddington 1972; Swearingen and Cohen 1985). These life events were: 1) being separated or divorced, 2) serious problems in marriage or co-habital relation, 3) problems or conflicts with family, friends or neighbors, 4) problems at work or in place of education, 5) economic problems, 6) serious illness or injury, 7) serious illness or injury in close family, 8) traffic accident, fire or theft, 9) loss of a close related person, and 10) other difficulties. The answers were graded according to the woman's reaction to the event (emotionally not so difficult/difficult/very difficult). The sum of scores from each item (graded according to severity 1–3) was used as the negative life event indicator (coded: "0 points", "1–5 points" or ">5 points"). The women with 0 points had reported no major life events.
5. History of being pressed or forced to sexual intercourse: The question was: "Were you ever pressed or forced to sexual intercourse after the age of 18 years?" (coded: "yes" or "no").
6. Attachment to partner: the question was: "Do you feel closely attached to your partner?" (coded: "closely attached to partner" or "partly or not attached to partner").
7. Socio-demographic variables: age, educational level and marital/cohabital status.

Statistical methods

Chi-square tests were used to test for equal prevalence of women reporting at least mild levels (a little, quite a bit or extremely) of each SCL-25 item among postpartum women as compared with non-postpartum women. Chi-square tests were also used to test for differences in the proportion of high-scorers on the SCL-anxiety scale (SCL-anxiety score ≥ 18) and on the SCL-depression scale (SCL-depression score ≥ 27). Students t-tests were used to assess differences in SCL-anxiety and SCL-depression mean scores. Crude and adjusted odds ratios of anxiety (SCL-anxiety score ≥ 18) and of depression (SCL-depression score ≥ 27) for being in the postpartum period were estimated by logistic regression analyses. Several of the potential confounding factors were only relevant for women with a prior delivery. Therefore, only women with one or more deliveries were included in the multivariate analyses ($n = 1,794$).

Results

Distribution of each SCL-25 symptom

Of the non-postpartum women, 4% (96/2,314) reported “thoughts of ending your life” as compared to none of the postpartum women (Table 1). In the non-postpartum group, women with a prior delivery reported significantly less suicidal ideation as compared to women without a prior delivery ($p < 0.001$). A significantly higher proportion of the postpartum women reported “crying easily” and “loss of sexual interest or pleasure” than the non-postpartum women. Of the non-postpartum women, 26% reported “difficulty falling asleep or staying asleep” as compared with 17% among the postpartum women (Table 1).

The prevalence of anxiety (defined as SCL-anxiety score ≥ 18) was 4.9% in the postpartum group and 11% in the non-postpartum group ($\chi^2 = 14.6$; $p < 0.001$) (Table 2). The mean SCL-anxiety score was 12.2 (SD = 2.5) in the postpartum group and 13.3 (SD = 3.7) in the non-postpartum group ($p < 0.001$). The prevalence of depression (defined as SCL-depression ≥ 27) was 10.8% in the postpartum women and 14.5% in the non-postpartum group ($\chi^2 = 14.6$; $p < 0.05$). The mean SCL-depression score was 19.8 (SD = 4.9) in the postpartum group and 20.7 (SD = 6.6) in the non-postpartum group ($p < 0.05$).

In the non-postpartum group, there was no significant difference in the prevalence of anxiety (11% vs. 11.1%) or depression (15% vs. 13.8%) between the women who had a prior delivery as compared to the women without a prior delivery (Table 2).

As a test of self-selection, the observed prevalences among responders to the reminder and among prompt responders were compared. The 532 non-postpartum women who only answered after a reminder did not have a significantly higher mean SCL-25 anxiety score (mean SCL-25 anxiety score 13.4 vs. 13.2; $p = 0.314$) or mean SCL-25 depression score (mean SCL-25 depression score 20.8 vs. 20.5; $p = 0.274$) than the 2,045 women who answered without a reminder.

Table 1 Proportion (percent) of women reporting at least mild levels (a little, quite a bit or extremely) of each SCL-25 item among 416 postpartum and 2,314 non-postpartum women 18–40 years of age within the same municipalities in Norway

Symptom	Postpartum (%)	Non-postpartum (%)
Suddenly scared for no reason	11	12
Feeling fearful	17	17
Faintness, dizziness, or weakness	27	29
Nervousness or shakiness inside	26	40***
Heart pounding or racing	5	15***
Trembling	3	10***
Feeling tense or keyed up	32	48***
Headaches	50	56*
Spells of terror or panic	5	8*
Feeling restless, can't sit still	16	26***
Feeling low in energy, slowed down	44	46
Blaming yourself for things	30	34
Crying easily	43***	32
Loss of sexual interest or pleasure	58***	40
Poor appetite	18	17
Difficulty falling asleep or staying asleep	17	26***
Feeling hopeless about the future	14	30***
Feeling blue	31	37*
Feeling lonely	28	27
Thoughts of ending your life	0	4***
Feeling of being trapped or caught	15	16
Worrying too much about things	44	54***
Feeling no interest in things	9	16**
Feeling everything is an effort	23	28
Feelings of worthlessness	8	14**

Significance level on the difference in proportions between postpartum and non-postpartum women (* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$)

The impact of the postpartum period on SCL-25 anxiety score

Among all women with at least one delivery ($n = 1,794$), a history of depression, high score on the life event scale (> 5 points), somatic disease, history of being pressed or forced to intercourse and severe premenstrual tension were significantly associated with anxiety. First-time mothers were significantly more anxious than multipara women (Table 3).

The estimated crude odds ratio for anxiety (defined as SCL-anxiety score ≥ 18) was 0.4 (95% CI: 0.3–0.7) for being in the postpartum period. When controlling for the identified risk factors above, the odds ratio was 1.2 (95% CI: 0.6–2.3) for being in the postpartum period (Table 3).

Table 2 Comparison of SCL-anxiety and SCL-depression scores in 416 postpartum and 2,314 non-postpartum women in a population-based questionnaire study in two Norwegian municipalities during the period 1998–1999

	SCL-A mean score	SCL-D mean score	% with SCL-A ≥ 18	% with SCL-D ≥ 27
Postpartum women (n = 416)	12.2 (SD 2.5)	19.8 (SD 4.9)	4.9%	10.8%
Non-postpartum women (n = 2,314)	13.3 (SD 3.7)	20.7 (SD 6.6)	11.0%	14.5%
With a prior delivery (n = 1,401)	13.3 (SD 3.7)	20.7 (SD 6.6)	11.0%	15.0%
Without a prior delivery (n = 913)	13.3 (SD 3.6)	20.6 (SD 6.6)	11.1%	13.8%

Table 3 Crude and adjusted odds ratios for anxiety (SCL-anxiety ≥ 18) and depression (SCL-depression ≥ 27) in 1,794 women with a prior delivery, in a population-based questionnaire study in two Norwegian municipalities during the period 1998–1999

	Crude odds ratio (95% CI)		Adjusted odds ratio (95% CI)	
	anxiety	depression	anxiety	depression
Being in the postpartum period				
No	1.0	1.0	1.0	1.0
Yes	0.4 (0.3–0.7)	0.7 (0.5–1.0)	1.2 (0.6–2.3)	1.8 (1.1–2.9)*
Number of children				
> 1 child	1.0	1.0	1.0	1.0
1 child	1.4 (1.0–1.9)*	1.1 (0.8–1.5)	2.1 (1.3–3.4)**	1.2 (0.8–1.8)
History of spontaneous abortion				
No	1.0	1.0	1.0	1.0
Yes	1.4 (1.0–2.0)*	1.3 (1.0–1.8)	1.7 (1.1–2.6)*	1.5 (1.0–2.2)*
Premenstrual tension				
No	1.0	1.0	1.0	1.0
Slight	1.5 (0.9–2.6)	1.4 (0.9–2.2)	1.3 (0.7–2.4)	1.3 (0.8–2.1)
Noticeable or very annoying	4.0 (2.4–6.5)***	3.1 (2.1–4.7)***	1.9 (1.0–3.5)*	1.9 (1.2–3.2)*
Prior depression				
No	1.0	1.0	1.0	1.0
Yes	12.8 (8.5–19.3)***	10.3 (7.5–14.1)***	6.7 (4.2–10.7)***	6.8 (4.7–9.8)***
Somatic disease				
No	1.0	1.0	1.0	1.0
Yes	6.7 (4.1–10.9)***	2.5 (1.8–3.3)***	3.5 (2.1–6.0)***	1.4 (1.0–2.1)
Life event score				
0 points (no events)	1.0	1.0	1.0	1.0
1–5 points	4.0 (2.5–6.4)***	5.2 (3.5–7.9)***	2.2 (1.3–3.9)**	3.5 (2.2–5.4)***
> 5 points	13.8 (8.4–22.7)***	15.2 (9.8–23.6)***	4.2 (2.3–7.5)***	5.9 (3.5–9.9)***
History of being pressed or forced to sexual intercourse				
No	1.0	1.0	1.0	1.0
Yes	5.1 (3.7–7.0)***	4.1 (3.1–5.4)***	2.2 (1.5–3.4)***	2.0 (1.4–2.9)***
Partner attachment				
Closely attached to partner	1.0	1.0	1.0	1.0
Partly or not attached to partner	2.9 (2.0–4.1)***	3.6 (2.7–4.8)***	1.7 (1.1–2.7)*	2.6 (1.8–3.8)***

The following variables were also included in the logistic regression analyses, but not significantly associated with anxiety or depression. Although entered in the analyses, these variables are not presented in the table: history of induced abortion, history of stillbirth, breastfeeding after last delivery, mode of last delivery, pelvic pain in last delivery, history of postpartum depression, age of the woman, educational level and marital status. Significance level (* p < 0.05; ** p < 0.01; *** p < 0.001)

■ The impact of the postpartum period on SCL-25 depression score

Among all women with at least one delivery (n = 1,794), a history of depression, high score on the life event scale, poor partner relationship, a history of being pressed or forced to intercourse and severe premenstrual tension were significantly associated with depression (Table 3).

The crude odds ratio of depression (defined as SCL-depression score ≥ 27) was 0.7 (95% CI: 0.5–1.0) for being in the postpartum period. When controlling for potential confounding factors, the odds ratio for being in the postpartum period was 1.8 (95% CI: 1.1–2.9) (Table 3).

Discussion

In the present study including 1,794 mothers aged 18–40, the crude prevalence of anxiety (defined as SCL-anxiety score ≥ 18) and depression (defined as SCL-depression score ≥ 27) was lower in postpartum as compared with non-postpartum women. However, when controlling for other risk factors the odds ratio of being in the postpartum period was 1.2 (95% CI: 0.6–2.3) for anxiety and 1.8 (95% CI: 1.1–2.9) for depression.

■ Prior studies

To our knowledge, only two recent studies, a Canadian (Whiffen and Gotlib 1993) and a Portuguese (Augusto et al. 1996), have compared the prevalence of anxiety and depression among women during the postpartum period and during time periods beyond pregnancy and postpartum. Both studies suggested that postpartum women experience less anxiety than non-postpartum women. However, these studies have methodological weaknesses. In the Canadian study, the postpartum women ($n = 900$) were recruited from specialized health care, whereas the non-postpartum women ($n = 98$) were obtained through a newspaper advertisement. Hence, the two groups of women may not be comparable with regard to the risk of depression, and only age and marital status were included as potential confounding factors. In the Portuguese study, postpartum women were identified through birth registers. The non-postpartum women were close friends of the postpartum women with similar age, marital status, number of children and social status. The estimated impact of the postpartum period is, therefore, not likely to be biased by confounding factors. In the same study, the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al. 1987) was applied to measure anxiety; however, the EPDS includes only two items measuring anxiety.

A longitudinal British cohort study reported increasing levels of anxiety during pregnancy to a maximum during the first postnatal week, before decreasing to the lowest level between 3 and 5 months after childbirth (Cox et al. 1982).

■ Potential sources of bias

High scores on the anxiety or the depression SCL-25 subscales are not equivalent with having an anxiety or depressive disorder. However, a recent Norwegian study (Sandanger et al. 1998) showed that the chosen cut-off levels gave the same prevalence estimates of an anxiety and depressive disorder as a CIDI interview (Composite International Diagnostic Interview) (Robins et al. 1988, 1994).

The response rate was higher among the postpartum (89%) than the non-postpartum women (63%). This may have caused a response bias if the prevalence of

anxiety or depression was different between responders and non-responders. However, the 532 non-postpartum women who only answered after a reminder did not have a significantly higher mean SCL-25 anxiety score or mean SCL-25 depression score as compared to the 2,045 women who answered without a reminder. This may indicate that lack of response in this study is not associated with anxiety or depression.

In the multivariate analyses, only women with a prior delivery were included in the non-postpartum group. We have no reason to believe that this has resulted in biased estimates since there were no differences in the prevalence of anxiety or depression between women with or without a prior delivery.

■ Interpretation of findings

In the present study, the postpartum women were less likely to report suicidal ideation as compared to the non-postpartum women. Also, the prevalence of suicidal ideation was lower among women with children as compared to women without children. This finding is in agreement with an earlier Norwegian study based on register data from 989,949 adult women (Høyer and Lund 1993). Some of the explanation of this finding could be that women choose to get pregnant when they are in a stable phase of life. In addition, there may be a protective impact of having children. Earlier findings suggest a selection bias showing a lower risk of depression among women who get pregnant (Eberhard-Gran et al. 2002).

Despite a significantly lower mean SCL-depression score, postpartum women reported easily crying more often than non-postpartum women. Crying did not seem to reflect the prevalence of other depressive symptoms and may not be an expression for a true depression among postpartum women.

Our results suggest that there is a predominance of depressive symptoms rather than symptoms of anxiety in the postpartum period. There may be a physiological explanation for the lack of anxiety symptoms. Lactation influences the prolactin, progesterone, estrogen, oxytocin and cortisol levels and has also been associated with changes in mood (Warner et al. 1996; Alder and Cox 1983).

Conclusion

The symptom profile of anxiety and depression seems to differ between postpartum and non-postpartum women. The overall risk of anxiety appeared to be the same in both groups, whereas the risk of depression was slightly increased in the postpartum group.

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References

1. Alder EM, Cox JL (1983) Breast feeding and postnatal depression. *J Psychosom Res* 27:139–144
2. American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders, 4th edn (DSM-IV). American Psychiatric Association, Washington, DC
3. Augusto A, Kumar R, Calheiros JM, Figueiredo E (1996) Postnatal depression in an urban area of Portugal: comparison of child-bearing women and matched controls. *Psychol Med* 26:135–141
4. Coddington DR (1972) The significance of life events as etiologic factors in the diseases of children. 2. A study of a normal population. *J Psychosom Res* 16:205–213
5. Cooper PJ, Campbell EA, Day A, Kennerly H, Bond A (1988) Non-psychotic psychiatric disorder after childbirth: a prospective study of prevalence, incidence, course and nature. *Br J Psychiatry* 152:799–806
6. Cox JL, Connor Y, Kendell RE (1982) Prospective study of the psychiatric disorders of childbirth. *Br J Psychiatry* 140:111–117
7. Cox JL, Holden JM, Sagovsky R (1987) Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry* 150:782–786
8. Eberhard-Gran M, Eskild A, Tambs K, Samuelsen SO, Opjordsmoen S (2002) Depression in postpartum and non-postpartum women: prevalence and risk factors. *Acta Psychiatr Scand* 105:426–433
9. Evans J, Heron J, Francomb H, Oke S, Golding J (2001) Cohort study of depressed mood during pregnancy and after childbirth. *BMJ* 323:257–260
10. Hesbacher PT, Rickels R, Morris RJ, Newman H, Rosenfeld MD (1980) Psychiatric illness in family practice. *J Clin Psychiatry* 41:6–10
11. Høyer G, Lund E (1993) Suicide among women related to number of children in marriage. *Arch Gen Psychiatry* 50:134–137
12. Kendler KS, Neale MC, Kessler RC, Heath AC, Eaves LJ (1993) The lifetime history of major depression in women: reliability of diagnosis and heritability. *Arch Gen Psychiatry* 50:863–870
13. Mathiesen KS, Tambs K, Dalgard OS (1999) The influence of social class, strain and social support on symptoms of anxiety and depression in mothers of toddlers. *Soc Psychiatry Psychiatr Epidemiol* 34:61–72
14. Nettelbladt P, Hansson LC, Stefansson G (1993) Test characteristics of the Hopkins Symptom Check List-25 (HSCL-25) in Sweden, using the Present State Examination (PSE-9) as a caseness criterion. *Soc Psychiatry Psychiatr Epidemiol* 28:130–133
15. O'Hara MW, Zekoski E (1988) Postpartum depression: a comprehensive review. In: Kumar R, Brockington I (eds) *Motherhood and mental illness*. Oxford University Press, London pp. 17–63
16. Pitt B (1968) "Atypical" depression following childbirth. *Br J Psychiatry* 14:1325–1337
17. Robins LN, Wing JK, Wittchen H-U, Helzer JE, Babor TF, Bruke J, Farmer A, Jablenski A, Pickens R, Regier DA, Sartorius N, Towle LH (1994) The Composite International Diagnostic Interview. In: Mezzych J, Jorge M, Salloum I (eds) *Psychiatric epidemiology. Assessments concepts and methods*. Baltimore, London
18. Robins LN, Wing JK, Wittchen H-U, Helzer JE, Babor TF, Bruke J, Farmer A, Jablenski A, Pickens R, Regier DA, Sartorius N, Towle LH (1988) The Composite International Diagnostic Interview. *Arch Gen Psychiatry* 45:1069–1077
19. Sandanger I, Moum T, Ingebrigtsen GH, Dalgard OS, Sørensen T, Bruusgaard D (1998) Concordance between symptom screening and diagnostic procedure. The Hopkins Symptom Checklist-25 and the Composite International Diagnostic Interview I. *Soc Psychiatry Psychiatr Epidemiol* 33:345–354
20. Swearingen EM, Cohen LH (1985) Measurement of adolescents' life events: the Junior High Life Experiences Survey. *Am J Community Psychol* 13:69–85
21. Warner R, Appleby L, Whitton A (1996) Demographic and obstetric risk factors for postnatal psychiatric morbidity. *Br J Psychiatry* 168:607–611
22. Whiffen V, Gotlib I (1993) Comparison of postpartum and non-postpartum depression: clinical presentation, psychiatric history, and psychosocial functioning. *J Consult Clin Psychology* 61:483–494
23. Winikur A, Winikur D, Rickels K, Cox DS (1984) Symptoms of emotional distress in a family planning service: stability over a four-week period. *Br J Psychiatry* 144:395–399
24. World Health Organization (1992) *The ICD-10 classification of mental and behavioural disorders. Clinical descriptions and diagnostic guidelines*. WHO, Geneva