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## Postpartum depression: prevalence and determinants in Lebanon

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### Summary

This study assesses the prevalence and determinants of postpartum depression (PPD). 396 women delivering in Beirut and a rural area (Beka'a Valley) were interviewed 24 hours and 3–5 months after delivery. During the latter visit, they were screened using the Edinburgh postnatal depression scale. The overall prevalence of PPD was 21% but was significantly lower in Beirut than the Beka'a Valley (16% vs. 26%). Lack of social support and prenatal depression were significantly associated with PPD in both areas, whereas stressful life events, lifetime depression, vaginal delivery, little education, unemployment, and chronic health problems were significantly related to PPD in one of the areas. Prenatal depression and more than one chronic health problem increased significantly the risk of PPD. Caesarean section decreased the risk of PPD, particularly in Beirut but also in the Beka'a Valley. Caregivers should use pre- and postnatal assessments to identify and address women at risk of PPD.

### Keywords

Postpartum depression; psychosocial factors; obstetric factors; type of delivery

### Introduction

Postpartum depression (PPD) is a depressive episode, starting within 6 months after childbirth, that meets the DSM-IV criteria for major depressive episode, without psychotic features (APA, 1994). Up to 20% of new mothers experience PPD that goes beyond the realm of “maternity blues” (O'Hara et al., 1990; Paykel et al., 1980). PPD occurs at a time when heavy demands are placed on a woman's resources and when infant learning and development are occurring. Children whose mothers experience PPD can have increased behavioural, cognitive, and emotional difficulties (Cooper and Murray, 1998; Murray et al., 1996; Cogill et al., 1986). Undetected PPD affects the mother, her infant, and her family and affects society through illness, social dysfunction, death, and the cost of medical treatment and services. Yet PPD is a preventable illness (Mrazek and Haggarty, 1994).

Four factors are consistently found to relate to PPD: lack of social, especially spousal, support (Collins et al., 1993; Hopkins et al., 1984; Gjerdingen and Chaloner, 1994), prior history of depression and other emotional problems (Wilson et al., 1996; Gotlib et al., 1991; Hopkins et al., 1984; Kumar and Robson, 1984), obstetric and infant problems (Campbell and Cohn, 1991; Kumar and Robson, 1984; Hopkins et al., 1987), and stressful life events (Hickey et al., 1997; Seguin et al., 1995; Areias et al., 1996). Nevertheless, none of these psychosocial factors can be used to predict which women will develop PPD.

A few studies have found that unemployment and unwanted pregnancy are associated with the risk of developing PPD (Lane et al., 1997;Ghubash and Abou Saleh, 1997;Warner et al., 1996). Biological factors related to hormone levels after birth may also contribute to the risk of PPD (Susman and Katz, 1988), although the evidence for the biological basis for PPD is weak (Harris, 1994). PPD is not associated with a family history of depression or other emotional disorders (Troutman and Cutrona, 1990;Hopkins et al., 1984), age, number of previous children, or marital status (Paykel et al., 1980;Hopkins et al., 1984).

Most of the work on PPD is carried out in Western countries, with only few recent studies conducted in the developing world. The lack of research on psychological morbidity, including puerperal psychosis, in developing countries has led to a gap in assessing the global burden of disease (WHO, 1998; Global Forum for Health Research, 2000). In Lebanon, as in many developing countries, the focus of prenatal and delivery care is on women's medical and obstetrical problems and on the baby's wellbeing. The social and psychological needs of pregnant women as they experience biological, physical, and physiological changes, and changes in social status, are rarely addressed. Our study is the first to assess the prevalence of PPD in communities in Lebanon and to determine some of its contributing factors.

## Subjects

The study sample was derived from maternity wards in nine hospitals in Beirut and the Beka'a Valley. The former is the capital city of Lebanon, and the latter is a rural area about 45km from the capital. All women who gave birth between October and December 1997 at hospitals in the Beka'a Valley and between June and August 1998 at hospitals in Beirut were approached after the delivery and asked to participate in a study. Consenting women were then asked to respond to a questionnaire administered in the hospital within 24 hours of delivery (phase I) and were also asked for a home interview to be conducted later (phase II). On average, the women in Beirut were seen at 5 months and the women in the Beka'a Valley at 4 months after delivery. 538 women (303 in Beirut and 235 in the Beka'a Valley) completed the initial interview. A total of 396 (74%) were followed up (68% in Beirut compared with 80% in the Beka'a Valley). The main reason for loss to follow-up in Beirut was poor addresses that did not allow women to be traced; the main reason in Beka'a Valley was the difficulty of reaching women living in very remote areas. The sociodemographic characteristics of women lost to follow-up in each area were compared with women reinterviewed. No significant differences were found except that women lost to follow-up had a lower educational level.

## Instruments and measurements

Data were collected through face to face interviews by using structured instruments constructed for phase I and II of the project by the principal investigator, and using the Arabic version of the Edinburgh postnatal depression scale (EPDS) (Cox et al., 1987). The EPDS is a 10-item questionnaire with good psychometric properties. The Arabic version was validated by Ghubash et al. (1997).

Questions were put in reverse chronological order (backward recall). In phase I, women were first asked about their newborn babies and the immediate postpartum period. They were then asked about their labour and delivery experience, including the type of delivery and specific obstetric procedures. Information was obtained on the prenatal period, including the presence of a chronic health condition (such as hypertension), occurrence of any stressful life events (such as death of a spouse), and the availability of social support. Finally, the respondent's age, marital status, parity, religion, education, occupation, sources of income, and monthly income, as well as her husband's education and occupation, were recorded.

In phase II, women were asked about their health, their baby's health, their use of healthcare services, contraception, and breastfeeding. The EPDS was also administered to assess current PPD and depression in the prenatal phase.

## Measures and statistical analyses

Women who scored above a threshold of 12/13 in the EPDS were considered to have PPD. Social support was assessed by number of close friends (zero or 1; 2 or more). A list of stressful life events (Farhood et al., 1993) was used to score exposure to stress (below the mean score, above the mean). Bivariate analyses of the outcome variable, PPD, were performed using chi-square tests. Potential multi-colinearities of independent variables were then examined by looking at pair-wise associations. Multiple logistic regression analysis was used to estimate the probability of having PPD after adjusting for covariates identified in the bivariate analyses.

## Results

### Characteristics of the sample

Table 1 shows the main characteristics of the population under study. Nearly all women in both areas were married (99%). The women in the Beka'a Valley had less education than those in Beirut and were less likely to have ever worked (10% vs. 37%). The Beka'a Valley women were also younger than the women in Beirut (27.4 vs. 28.7 years) and had married earlier (20.7 vs. 22.7 years). A higher proportion of the women in the Beka'a Valley was multiparous (76% vs. 64%) and had a preterm delivery (14% vs. 4%).

### Postpartum depression: prevalence, incidence, and risk factors

Slightly more than one in five women (21%) were found to have PPD according to the EPDS. The prevalence of PPD in the Beka'a Valley was significantly higher than in Beirut (26% vs. 16%;  $P = 0.016$ ) (Table 2). Of the 21% with PPD, 12% had also experienced depression during the index pregnancy, whereas a further 9% first developed depression in the postpartum period (incident cases).

Table 2 also presents bivariate analyses for Beirut and the Beka'a Valley separately and for the total. With respect to psychosocial variables, low social support and depression during pregnancy were significantly related to PPD in both areas. Lifetime depression was significantly related to PPD among women in Beirut and stressful life events a predictor of borderline significance for women in the Beka'a Valley.

Among the intrapartum variables considered, type of delivery was associated with PPD. The nature of the relation, however, differed in the two areas. In Beirut, a significantly higher proportion of women who delivered vaginally was depressed after delivery compared with those who delivered by caesarean section (21% vs. 7%). In the Beka'a Valley, the opposite was true (23% vs. 37%), and the relation was of borderline significance. Women with more than one chronic health problem during pregnancy were more likely to have PPD. Although the pattern was the same in both areas, it was significant only among women in the Beka'a Valley and in the total sample. In the Beka'a Valley, PPD occurred less often in women who breastfed directly than in women who did not breastfeed, and the association was of borderline significance. Pregnancy term, planned pregnancy, and parity were not related to PPD in either area.

PPD was associated with educational level in the Beka'a Valley; women of a low educational level were more depressed. Not being employed before or during pregnancy was of borderline statistical significance among women surveyed in Beirut.

Table 3 shows results of the multivariate analysis. It indicates that, after adjusting for potential confounders, the main significant determinants of PPD are depression during pregnancy, reporting more than one chronic health problem, type of delivery, and the interaction between area and type of delivery. The odds of having PPD for women who were depressed during pregnancy is 6.7 times compared with those with no depression during pregnancy (95% confidence interval odds ratio 3.5 to 12.8). Women who reported more than one chronic condition are 2.4 times more likely to have experienced PPD (95% confidence interval odds ratio 1.2 to 5.3) than those who did not report any. A significant interaction was found between type of delivery and place. Compared with women in Beirut with vaginal deliveries, women having caesarean sections were less likely to be depressed, although the effect in Beirut was much more marked than the Beka'a Valley (0.14 compared with 0.86).

## Discussion

This study is one of very few looking at PPD among women from developing countries and, more specifically, is one in addition to only three others from the Middle East (Glasser et al., 1998;Ghubash and Abou-Saleh, 1997;Fisch et al., 1997). Moreover, to our knowledge, it is the first to show rural and urban differentials in PPD. The data have some limitations: PPD and its potential risk factors were based on self reports of the woman and retrospective information rather than on psychiatric evaluation and other objective measures. But these methods are comparable to the approaches used by other population-based studies.

The overall prevalence of PPD, 21%, is consistent with other studies in the Middle East (Glasser et al., 1998;Ghubash et al., 1997;Fisch et al., 1997) and is also in line with the range of prevalence reported in Western countries (Richards, 1990). This also holds for the level of incident cases (9%) (Fisch et al., 1997).

In our study, the risk factor most likely to predict PPD is prenatal depression. This is consistent with other studies (Hopkins et al., 1984;Gotlib et al., 1991). Although it is possible that women having PPD may be more likely to recall pregnancy as a bad experience and to overreport symptoms of depression, the literature confirms that the relation between previous depression and PPD holds true irrespective of the study design. Chronic medical conditions were also associated with PPD in our study. This confirms previous findings relating the mother's general health to PPD (Gjerdingen and Chaloner, 1994). Medical disorders can alter or disrupt neurotransmitter functions or can simply act as a severe stressor. Both mechanisms predispose to general depression or may also act with PPD.

Previous findings relating PPD to social support, breastfeeding, and stressful life events were not confirmed in our study, although having social support from more than one person significantly reduced PPD in the bivariate analysis. It is worth noting that, in our culture, almost everyone has some support, and the low support category in our data included a majority with one person available for support.

An interesting finding was observed for place of residence and type of delivery. In the bivariate analysis, women in the Beka'a Valley were more likely to have been depressed both during pregnancy and during the postpartum period. But the two groups of women differ in terms of education, parity, and work status. In the multivariate analysis, which adjusted for these and other variables, the Beirut/Beka'a Valley difference was no longer significant, which implies that the effect may have been due to socioeconomic status. Place of residence, however, influenced the type of delivery, indicating that, although women in Beirut with caesarean section were protected against PPD, the effect of caesarean section was much less marked for the women in the Beka'a Valley.

The literature on women's attitudes towards, and perceptions of, caesarean section as well as its potential role in PPD varies. In settings as diverse as North America and sub-Saharan Africa, natural birth is highly desired, and some women find caesarean section traumatic (Reichert et al., 1993). A study in Turkey, which is close to Lebanon, reports dissatisfaction with caesarean section (Tatar et al., 2000). On the other hand, in other places—for example, Latin America—caesarean section is seen as a preferable and less traumatic way to deliver (Faundes and Cecatti, 1993).

The weaker protective effect of caesarean section in the Beka'a Valley possibly reflects a more traditional culture, where natural childbirth is more valued. Qualitative research on women's experiences of maternity care in Beirut and the Beka'a Valley indicated that many women, especially in the Beka'a Valley, were pleased to be delivered vaginally: "I was so happy that I could deliver normally. I was always afraid that I would need a caesarean section ..." (Kabakian-Khasholian et al., 2000). Women in the Beka'a Valley were also more stoical about pain and were less likely to request epidural pain relief. In Beirut, the capital, the pace of life is different, and there is a high level of health services use especially among educated women. Referring to the same qualitative research, data showed that women in Beirut see vaginal delivery as a source of fear, pain, and stress compared with caesarean section and therefore request epidurals for a less painful vaginal delivery.

Other literature suggests that the amount of preparation for either normal delivery or caesarean section can modify the negative effect of either mode of delivery (Mutryn, 1993; Reichert et al., 1993). Prevention programmes in U.S. population aimed at reducing risks associated with childbearing and, more particularly, with caesarean births have used anticipatory guidance and were able to reduce distress among mothers with caesarean births (Institute of Medicine, IOM, 1994). Thus the protective effect of caesarean section seen in the study may be because women have little pre-natal preparation for vaginal delivery (Kabakian-Khasholian et al., 2000) and may receive better information about caesarean section.

Finally, one possible explanation why caesarean section seems to protect against PPD in Beirut may be due to residual confounding with socioeconomic status (Khayat and Campbell, 2000). In Lebanon the medical system is highly privatised, and women of higher socioeconomic status are more likely to receive caesarean sections. Education was the proxy indicator for SES. Women with high education (University) have higher cesarean rates (34.5%) compared to those with lower education (26%).

In conclusion, our study confirms that the prevalence of PPD is broadly similar to that in other countries, and that depression in pregnancy or more than one chronic problem are major risk factors. An interesting finding was the interaction between residency and type of delivery, which suggests that the role of cultural norms and preparedness for birth events may be important. Variables such as social support and lifetime depression were not significant predictors in the multivariate analysis, although they were significant in the bivariate analyses.

## Implications

This study along with other studies on postpartum women prove that a sizable proportion of women experience a deterioration in their psychological health and social adjustment during pregnancy. Health care providers need to address psychological issues when providing care. This can be done by teaching physicians and midwives about the emotional needs of pregnant women, the use of prenatal care in identifying emotional problems, and appropriate explanations to prevent PPD or mitigate its effect. Almost all women in Lebanon (87%) have at least one prenatal visit (Ministry of Public Health, 1998). The opportunity exists to identify

women during their postnatal visits, although use of the latter service is less common (~50% from our data). Women should also be prepared for possible adjustment problems after the birth and should be taught coping strategies to prevent PPD. In addition, the data suggest that women may need to be better prepared for obstetrical procedures and that cultural context plays an important part in the interpretation of the birth event, even within a country.

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Table 1

Distribution of sample by selected socio-demographic variables and by area

Variables	Beirut		Beka'a Valley		Percent
	Number	Percent	Number	Percent	
<b>Social status</b>					
Married	204	98.6	188	98.6	99.5
Not married	3	1.5	1	1.5	0.5
<b>Education</b>					
Illiterate	8	3.9	16	3.9	8.5
Read and write	4	1.9	6	1.9	3.2
Elementary	29	14.0	35	14.0	18.5
Intermediate	60	29.0	80	29.0	42.3
Secondary	40	19.3	35	19.3	18.5
University	41	19.8	17	19.8	9.0
Technical	25	12.1	0	12.1	0
<b>Occupational status</b>					
Worked during pregnancy	55	26.6	11	26.6	5.8
Stopped working during pregnancy	19	9.2	8	9.2	4.2
Never worked	133	64.3	168	64.3	88.4
<b>Birth order</b>					
Primiparous	74	35.7	46	35.7	24.3
Multiparous	133	64.3	143	64.3	75.5
<b>Pregnancy term</b>					
Full term	198	95.7	163	95.7	86.2
Preterm	9	4.3	26	4.3	13.8
Mean age ( $\pm$ SD)		28.7 ( $\pm$ 5.7)			27.4 ( $\pm$ 6.1)
Mean age at marriage ( $\pm$ SD)		22.7 ( $\pm$ 4.8)			20.7 ( $\pm$ 8.9)
Mean time from delivery to interview in days ( $\pm$ SD)		159.3 ( $\pm$ 43.9)			112.6 ( $\pm$ 27.3)

Table 2

Percent cases with postpartum depression by selected variables and by area

Variables	Beirut			Beka'a Valley			Total		
	N	% cases	P	N	% cases	P	N	% cases	P
<b>Psycho-social variables</b>									
Social support (NB. Of close support)									
0 to one person	88	25.0	0.004	93	33.3	0.044	181	29.3	0.000
More than one	119	10.1		81	19.8		200	14.0	
Depression during pregnancy									
No	146	7.5	0.000	116	11.2	0.000	262	9.2	0.000
Yes	59	39.0		72	48.6		131	44.3	
Lifetime depression									
No	175	10.9	0.000	161	24.2	0.315	336	17.3	0.000
Yes	31	48.4		27	33.3		58	41.4	
Stressful life events									
Below the mean	136	15.4	0.767	97	19.6	0.07	233	17.2	0.121
Above the mean	65	13.8		83	31.3		148	23.6	
<b>Intra-partum variables</b>									
Delivery type									
Vaginal	145	20.7	0.011	143	23.1	0.063	288	21.9	0.59
C-section	46	6.5		46	37.0		92	19.4	
Pregnancy term									
Full term	198	17.2	0.361	163	25.8	1.000	361	17.2	0.626
Preterm	9	0.0		20	25.0		29	21.1	
Chronic problems for the mother									
None	69	15.9	0.236	72	13.9	0.000	141	14.9	0.000
One problem	63	11.1		56	19.6		119	15.1	
More than one problem	73	21.9		62	46.8		135	33.3	
Breastfeeding directly after delivery									
Yes	126	17.5	0.616	81	19.8	0.066	207	18.4	0.164
No	81	14.8		97	32.0		178	24.2	
Planning pregnancy									
Yes	124	13.7	0.197	88	25.0	0.672	212	18.4	0.141
No	83	20.5		101	27.7		184	24.5	
Birth order									
Primiparous	74	16.2	0.952	46	26.0	0.948	120	20.0	0.697
Multiparous	133	16.5		143	26.1		276	21.0	
<b>Socio-demographic variables</b>									
Education									
Low	12	8.3	0.256	22	45.5	0.040	34	32.4	0.245
Medium	114	20.2		115	20.9		229	20.5	
High	81	12.3		52	30.8		133	19.5	
Occupational status									
Worked during pregnancy	55	9.1	0.087	11	27.3	0.958	66	12.1	0.047
Did not work	152	19.1		177	26.6		329	23.1	
<b>Total PPD</b>	<b>207</b>	<b>16.4</b>		<b>189</b>	<b>26.3</b>		<b>396</b>	<b>21.3</b>	<b>0.016</b>

Multiple logistic regression analysis of postpartum depression with selected psychosocial, pregnancy, and delivery related factors and other social factors: best model

**Table 3**

Variables	B coefficient	SE (B)	OR	95%CI OR
<b>Depression during pregnancy (No)</b>				
Yes	1.8957	0.33	6.66	3.47–12.78
<b>Chronic problems (none)<sup>d</sup></b>				
One chronic problem	-0.665	0.43	0.94	0.40–2.19
Two or more chronic problems	0.883	0.39	2.42	1.13–5.15
<b>Delivery type (vaginal)</b>				
Caesarean section	-1.9871	0.71	0.14	0.03–0.56
<b>Area (Beirut)</b>				
Beka'a Valley	-0.0705	0.37	0.93	0.45–1.94
<b>Area x Delivery type</b>	1.8847	0.85	6.58	1.25–34.76
<b>Stressful life events (Below the mean)</b>				
Above the mean	0.1757	0.32	1.19	0.63–2.27
<b>Social support (one or no confidant)</b>				
More than one confidant	-0.4134	0.33	0.66	0.35–1.26
<b>Life time depression (No)</b>				
Yes	0.5827	0.38	1.79	0.87–3.74
<b>Education (medium)</b>				
Low	0.1119	0.36	1.12	0.55–2.27
High	0.6831	0.53	1.98	0.70–5.61
<b>Working (no)</b>				
Yes	-0.3034	0.55	0.74	0.25–2.15
<b>Breastfeeding (no)</b>				
Yes	-0.3686	0.34	0.69	0.35–1.35

<sup>d</sup>In brackets are the reference categories.

Hosmer and Lemeshow Goodness-of-Fit Test + 8.7373 eight degrees of freedom, P-value + 0.3649.