



## Case Report

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## Screening for Depression and Anxiety Symptoms during the First two Weeks Postpartum at Rafic Hariri University Hospital in August and September 2017

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### Abstract

Mood and mental disorders are prevalent worldwide, affecting a great number of individuals of all ages. Depression is frequently associated with the perinatal period with variable prevalence rates.

**Objectives:** The primary objective of the present study is to identify the prevalence of the postpartum depression (PPD) during the first 2 weeks postpartum. The secondary objectives were to differentiate PPD from baby blues and to identify the associated risk factors.

**Methodology:** This is a cross-sectional, uni-center, study conducted at the Rafic Hariri University Hospital in Lebanon using data from a direct survey with a sample of 200 women who gave birth to a singleton healthy baby at term between 1 August 2017 till 30 September 2017.

**Results:** Edinburgh Postnatal Depression Scale (EPDS) was used to identify women who may have postpartum depression. The mean EPDS score was 10.94 over 30 with a minimum of 0 over 30 and a maximum of 25 over 30. The EPDS results show that 32.8% of the participants have depression, 24.6% have a significant risk of depression and 42.6% have no depression. The results showed that women who underwent a C-section were more depressed (43%) comparing to women who underwent a normal delivery (29.8%) ( $P=0.048$ ). Women are at high risk of depression when the pregnancy duration is increasing ( $p=0.010$ ). There was no statistical significant correlation between the depression status and the following characteristics: the age, the nationality of the participants, the smoking status and the sex of the baby ( $p\text{-value} > 0.05$ ).

**Conclusion:** The current study established the significant correlation between postpartum depression and delivery type as well as gestation period. Moreover, women with longer gestational periods can be closely monitored for the appearance of depressive symptoms. This would ensure the early detection and management of postpartum depression in this high-risk cohort and the prevention of the deleterious effects of this disorder.

**Keywords:** Postpartum Depression, Screening, Cesarean, Gestation Period, Delivery Type

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### Introduction

According to the World Health Organization (WHO), depression is the leading cause of disability in the world, with 300 million people suffering from this disorder across all age groups.<sup>[1,2,3,4]</sup>

Depression is frequently associated with the perinatal period with variable prevalence rates. The latter differ according to the adopted screening criteria, as well as the timeframe within which depression is investigated. Depression can occur during pregnancy or after delivery. Depression rates during pregnancy itself were not consistent across the 3 trimesters, the first trimester having the lowest depression rates, which were found to increase in the remainder of the pregnancy.<sup>[5]</sup> The prevalence of depression is variable across different age groups, occupations and patient cohorts.<sup>[6,7,8]</sup>

According to the NICE clinical guideline for the management of perinatal maternal mental health, depression affects 12% of women during pregnancy, while anxiety is exhibited by approximately 13% of pregnant women. Moreover, the two conditions can coexist, with pregnant women suffering from both depression and anxiety. Mental health disorders are not restricted to the gestational period, but could continue to affect or appear following childbirth. In fact, 15 to 20% of women continue to suffer from depression and anxiety a year after delivery.<sup>[9]</sup> Other mental conditions are also associated with pregnancy and the post-partum period and include panic disorder, generalized

anxiety disorder (GAD), obsessive compulsive disorder (OCD), post traumatic stress disorder (PTSD) and tokophobia. These disorders can exist alone or occur concomitantly with depression and are less frequently observed when compared to depression and anxiety<sup>[9]</sup>. Maternal and neonatal outcomes are affected by the incidence of depression or other mental health conditions. The latter lead to 1.27 maternal deaths per 100,000 deliveries between 2006 and 2008 in the UK alone<sup>[9,10]</sup>.

Post-partum affective illness can be divided into 3 subtypes, namely the blues, postpartum depression and postpartum psychosis. Postnatal psychosis is one of the most deleterious disorders known to be induced or exacerbated by pregnancy. It involves symptoms of mania, depression, paranoia, hallucinations as well as delusions and is known to affect 1 to 2 women out of 1000 regardless of previous psychiatric history<sup>[9]</sup>. Women with a known history of bipolar disorder or a family history of postpartum psychosis are at a significantly greater risk (up to 50%) of developing the disorder<sup>[11]</sup>.

Although no established criteria are available, baby blues are widely considered to consist of a range of physical discomforts and symptoms. The latter include dysphoric mood, crying, mood lability, anxiety, insomnia, loss of appetite, and irritability. Post-partum blues are commonly observed in women in the first week following delivery, with variable prevalence rates between 26 (12) and 84% (13, 14). Postpartum blues generally subside approximately 10 days or 2 weeks after delivery in the event that symptoms do not evolve into postpartum depression. The risk of developing postpartum depression is thus elevated in women exhibiting postpartum blues, which could be considered a risk factor of this condition<sup>[12]</sup>.

In postpartum depression, the postpartum period is not limited to the days or weeks after childbirth, but extends to up to 1 year following delivery of the baby<sup>[9]</sup>. Depressed mothers can experience feelings of extreme sadness, anxiety, and exhaustion<sup>[16, 17]</sup>. Other symptoms include appetite and sleep disturbances. However, the aforementioned manifestations of postpartum depression are not exclusively observed in women suffering from this disorder.<sup>[18, 19]</sup>

Postpartum depression is a serious public health issue whose management remains challenging. According to the American Mental Health Counselors Association, more than 1 out of 7 women will suffer from postpartum depression or a related disorder. These rates are known to increase in socioeconomically challenged settings, with approximately 1 out of 4 women exhibiting postpartum depression. This reflects the established higher prevalence of depression among women as compared to men, who are half as likely to develop depression than women.<sup>[21]</sup>

The global prevalence of postpartum depression to be notably high at 17.7%<sup>[22]</sup>. Researchers further noticed the variability of postpartum depression prevalence according to the nation from which the data was generated. The prevalence of postpartum depression was significantly moderated by different factors, including socioeconomic and work factors. In fact, income inequality was significantly associated with a higher rate of postpartum depression. This falls in line with the established higher predilection of individuals from low to middle-income countries to present with depression in general. Moreover, mothers who worked more than 40 hours per week also exhibited higher rates of postpartum depression<sup>[22]</sup>.

Despite its established repercussions both on maternal, infant and familial outcomes, postpartum depression remains under recognized and undertreated<sup>[23]</sup>. Through its effect on maternal productivity and the subsequent loss of income, untreated postpartum depression is estimated to cost \$7,200 annually per mother.<sup>[21, 24]</sup>

Several variables emerged as having a significant relationship with

the incidence of post-partum depression: the family income<sup>[25]</sup> and the stress induced by financial distress or insufficiency as well as that engendered by caring for a child. On the other hand, a significant negative association was established between marital satisfaction and post-partum depression<sup>[25]</sup>. The absence or insufficiency of social support during pregnancy lead to postpartum depression following a strong and statistically significant association<sup>[25]</sup>. On the other hand, It was established that a strong association existed between depression and anxiety during the gestational period and the incidence of postpartum depression<sup>[25, 26]</sup>.

In other words, postpartum depression emerges as a significant influencer of maternal behavior. Mothers suffering from postpartum depression have lower performance when it comes to infant care<sup>[27, 28, 29]</sup>. The effect of postpartum depression is not limited to the mother, but also affects their children, with a predilection for male babies<sup>[30, 31, 32, 33, 34]</sup>. The impact of postpartum depression extends into childhood and is not limited to the period immediately after birth<sup>[35, 36]</sup>. Postpartum depression is thus a serious pregnancy-related complication necessitating the implementation of preventative as well as curative approaches in prenatal and postnatal care strategies<sup>[37, 38, 39, 40, 41, 42, 43, 44, 45]</sup>.

Screening for postpartum depression is essential and allows the prevention and treatment of this condition in pregnant women or those who had recently given birth. A variety of screening tools are available in the healthcare settings<sup>[59]</sup>. However, no guidelines are available regarding their use and the timeframe in which they should be adopted. The Edinburgh Postnatal Depression Scale (EPDS) was the most widely used screening test, with 68% of examined articles adopting it<sup>[60]</sup>. The time frame for the application of the screening process however shows great variability. Despite the specification of 6 weeks after delivery as the upper limit for the diagnosis of postpartum depression, the majority of studies exceeded this timeframe in their screening for the condition<sup>[60]</sup>. Concerning its sensitivity in the diagnosis of postpartum depression, the EPDS is significantly more accurate than other screening tests<sup>[61, 15, 25]</sup>. The EPDS is a screening tool for postpartum depression that is designed to detect this condition in women 6 to 8 weeks following delivery<sup>[18]</sup>. This test however is not capable of diagnosing postpartum depression or other serious mental health conditions. The EPDS consists of 10 questions the answers to which are scored from 0 to 3, reflecting the severity of the symptoms<sup>[18]</sup>. The addition of the scores provides the final test result, based on which patients are referred for further assessment or deemed healthy. Cut-off scores are the score at which women are deemed positive for postpartum depression. Throughout studies, the cut-off values are variable and range from 10 to 14, with a mean cut-off point of 11.5. Moreover, studies chose 10 most frequently as the cut-off score for the EPDS and detection of postpartum depression<sup>[60, 62]</sup>.

The EPDS has been employed for the detection of depression in Lebanese mothers at different timepoints. It was actually successfully used for the screening of postpartum depression at day 2, day 30 to 40 as well as 3 to 5 months after delivery<sup>[56, 57]</sup>. Researchers were thus able to characterize the prevalence and determinants of postpartum depression in the Lebanese population based on the EPDS scores, which renders it valid and applicable in a Lebanese setting.<sup>[46, 47, 48]</sup>

Women who experienced stressful life events during pregnancy were significantly more likely to be depressed<sup>[48, 49]</sup>. On the other hand, pregnancy complications such as previous spontaneous abortion, preterm births, fetal death and early neonatal death were significantly associated with depression and anxiety<sup>[50, 51]</sup>. Pregnancy-related conditions were similarly found to contribute to postpartum depression. Women with pre-eclampsia exhibited double the

prevalence rates of postpartum depression when compared to normal women<sup>[52]</sup>. On the other hand, vitamin D deficiencies during pregnancy were also correlated with increase risk for postpartum depression. Women with serum 25(OH)D levels below 50 nmol/l were actually 2.67 times more likely to exhibit postpartum depression<sup>[53]</sup>. The quality of a marital relationship has been frequently investigated as a possible determinant of postpartum depression<sup>[46]</sup>. A group of investigators examined the association between postpartum depression and polygamy and found that women living in polygamy were significantly more likely to be depressed postpartum when compared to their monogamous counterparts<sup>[49]</sup>. The behavior of a mother's partner could greatly affect her mental health. In fact, partner alcoholism was correlated with the incidence of postpartum depression. Moreover, a violent partner was similarly significantly associated with depressive symptoms in women post-partum<sup>[47, 48, 49, 54, 55]</sup>.

Many researchers have undertaken the characterization of postpartum depression in the Lebanese population. It was found that 33.3% of women suffered from postpartum depression on the second day after delivery, while 12.8% exhibited this condition when assessed 30 to 40 days postpartum<sup>[56]</sup>. The EPDS score >9 was considered indicative of postpartum depression and when assessed at day 2, EPDS score was found to significantly and positively predict the score 30 to 40 days after delivery. Thus, women with high scores 2 days postpartum were likely to present with high EPDS scores when assessed 1 month later, which allows the prediction of postpartum depression and its early detection. As for postpartum depression risk factors in this Lebanese cohort, it was found that previous personal but not familial history of depression and an EPDS score greater than 9 at day 2 postpartum were the only significant correlates of postpartum depression one month after delivery<sup>[56]</sup>. Another study established the prevalence and determinants of postpartum depression among Lebanese mothers 3 to 5 months after delivery. This was achieved through the application of the EPDS over the telephone, which revealed that the prevalence of postpartum depression was high overall and differed between regions. In fact, while the overall prevalence was 21%, women from the Bekaa Valley had 26% prevalence of postpartum depression as compared to 16% in Beirut<sup>[57]</sup>. The determinants of postpartum depression were similarly variable in each examined region, with lack of social support and prenatal depression predicting postpartum depression in both women from Beirut and Bekaa Valley. On the other hand, lifetime depression, and delivery type were significantly associated with postpartum depression in Beirut only. As for Bekaa Valley, postpartum depression could be predicted by stressful life events, chronic maternal health problems, and low educational level<sup>[57]</sup>. Badr (2018) investigated the risk factors associated with postpartum depression and impaired mother-infant bonding in a Lebanese population. History of alcohol use, pregnancy and infant-related complications, bad marital relationship, a history of depression and low social support emerged as significant predictors of postpartum depression. Moreover, women who were older, had a past history of depression and who received little social support were significantly associated with impaired mother-infant bonding<sup>[58]</sup>.

However, extant evidence from Lebanon regarding the prevalence and determinants of postpartum depression as well as its risk factors remain scarce. Further research and epidemiological studies are therefore required. The generation of such data would allow the guidance of prenatal and postnatal care in order to ensure optimal maternal and neonatal outcomes. The deleterious effects on postpartum depression affect mothers on the physical, mental, social, familial as well as professional level. Children and families of affected mothers are similarly affected, with documented impairment

of child cognitive and emotional development, in addition to poor marital relationships. Moreover, untreated postpartum depression is associated with significant costs, which highlights the need for the inclusion of adequate screening and treatment interventions in normal prenatal and antenatal care. The establishment of the risk factors and predictors of postpartum depression is necessary on the national level in order to account for socioeconomically and cultural differences in the manifestation of this phenomenon.

The primary objective of our study is to identify the prevalence of the postpartum depression during the first 2 weeks postpartum.

The Secondary objectives are:

- to identify risk factors associated with the diagnosis of PPD.

## Subjects and Methods

This is a cross-sectional, uni-center, study conducted in 1 hospital in Lebanon (Rafic Hariri University Hospital), using data from a direct survey with a sample of Two hundred women were recruited in August and September 2017 in Beirut receiving their care and follow-up.

### The subjects included in the study are:

- Women who gave birth at RHUH to a singleton healthy baby at term between 1 August 2017 till 30 September 2017

### We excluded from the study:

- The women complicated by mental disorders currently undergoing psychotherapy or on medications.
  - Women giving birth to an unhealthy baby (premature baby or necessitating NICU admission or having any chromosomal aneuploidy).
- Demographic data was collected using a short questionnaire, using a telephone interview.

The data collection includes the following:

- Age
- Parity
- History of mental disorders
- Delivery mode
- Educational status of the mother
- PMS
- Edinburgh postpartum depression scale (EPDS) at 0 and 2 weeks postpartum between 1 August 2017 and 30 September 2017. The EPDS is a 10 item self-reported questionnaire where each item is rated on a 4-points scale giving maximum score of 30. scores more than 12 or 13 is considered a significant case of postpartum depression while scores between 10-12 are borderline and between 0-10 are not depressed, this scale is designed specifically for the detection of depression in postpartum period (Appendix 3).

This protocol was reviewed and granted a written study approval from the institutional review board (IRB) at Mount of Lebanon Hospital and approved by the rest three hospitals where the study was enrolled.

This study was conducted in accordance with the US Code of Federal Regulation 45- CFR -46.107, 21-CFR-56.107, Good Clinical Practice ICH Section 3 and the principles laid down by the 18th World Medical Assembly (Helsinki, 1964) and all applicable amendments.

All patients signed an informed consent in Arabic (Appendix 4) before the recruitment in the study. Names and information of participant individuals will not be shared with third parties. All participants will have a designated code to conceal their name and identity.

No further written permission is needed for use of this Health Survey (SF36) and the VAS score.

Data collection forms will be stored and none can access the sheets except the researchers. All the Data collection forms will be damaged after 10 years of the study results submission.

Data was analyzed using the SPSS version 22.

The primary endpoint "EPDS" was presented as the frequency, mean

and standard deviation of participants. Secondary endpoints were presented as per the variable category. The categorical variables will be presented as frequency and proportions. The continuous variables will be presented as the frequency, mean and standard deviation.

The primary endpoint “EPDS” was statistically compared to: the demographic variables using ANOVA test and t-Test the medical conditions using ANOVA test the pregnancy characteristics Significance level will be set at 5% (p-value less than 0.05)

**Results**

Two types of analysis were performed: the descriptive analysis and the analytical Analysis.

**Demographic Characteristics**

The mean participant age was 30 years with a minimum of 18 years and a maximum of 45 years. (Table 1) Parturient participating in the study were distributed between Syrian

(56%) and Lebanese (44%). (Figure 1)

**Pregnancy Characteristics**

The mean participant Gravida was 2.8 (3) pregnancies with a minimum of 1 pregnancy and a maximum of 9 pregnancies. The mean participant Para was 1.87 (2) babies with a minimum of 0 baby and a maximum of 8 babies. The mean Aborta was 0.3 abortion with a minimum of 0 abortion and a maximum of 3 abortions. (Table 2).

The mean pregnancy days was 271 days (38.7 weeks) with a minimum of 242 days (34.6 weeks) and a maximum of 291 days (41.6 weeks). (Table 3)

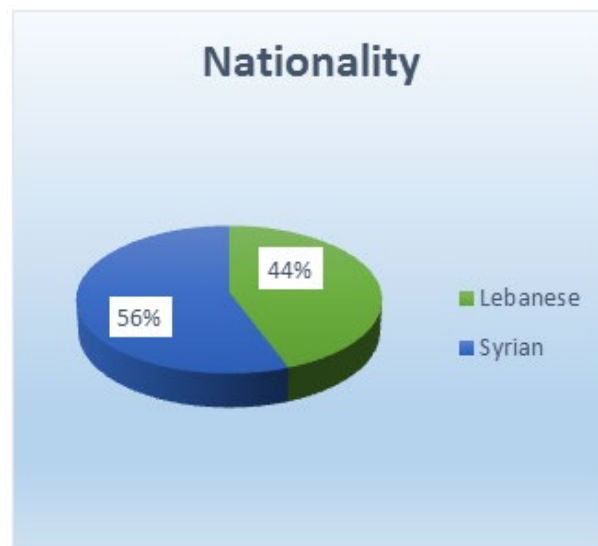
The delivery was NVD (normal vaginal delievery) in 77% of cases while 23% of parturient underwent C-section. (Figure 2)

Newborn babies were distributed between boys (43%) and girls (57%). (Figure 3)

The majority of parturient are non-smokers (82%) and 18% were smokers. (Figure 4)

	N	Mean	Median	Std. Deviation	Minimum	Maximum
<b>Age</b>	122	29.61	29.00	5.559	18	45

**Table 1:** Distribution of participant as per their age



**Figure 1:** Distribution of participant as per their nationality

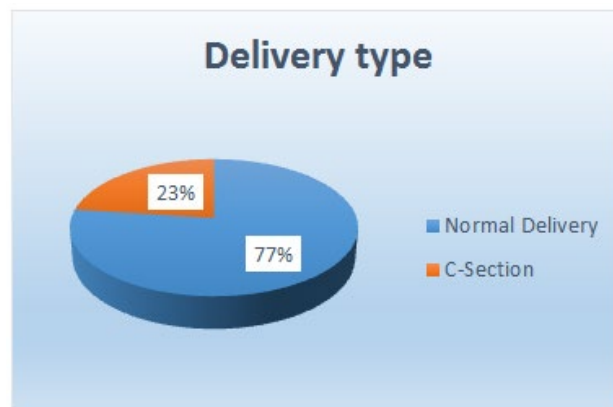


	N	Mean	Median	Std. Deviation	Minimum	Maximum
<b>GPAL: Gravida</b>	122	2.84	2.00	1.916	1	9
<b>GPAL: Para</b>	122	1.87	2.00	1.841	0	8
<b>GPAL: Aborta</b>	122	0.28	0.00	0.659	0	3

**Table 2:** Distribution of participant as per their GPAL

	N	Mean	Median	Std. Deviation	Minimum	Maximum
<b>G Days</b>	122	270.98	273.00	7.797	242	291

**Table 3:** Distribution of participant as per their GPAL



**Figure 2:** Distribution of participant as per their delivery type

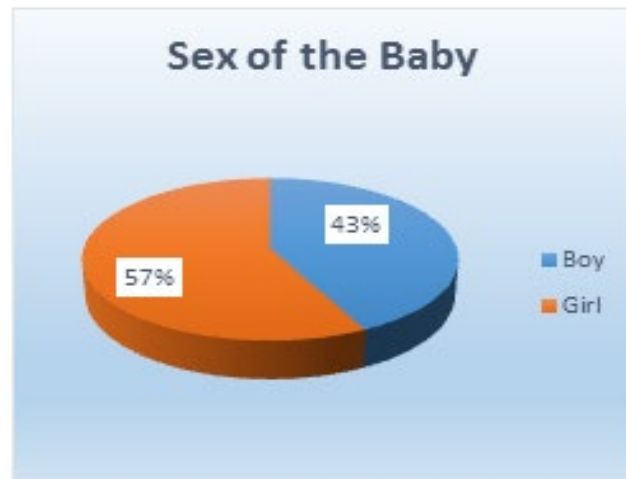


Figure 3: Distribution of participant as per the sex of the baby

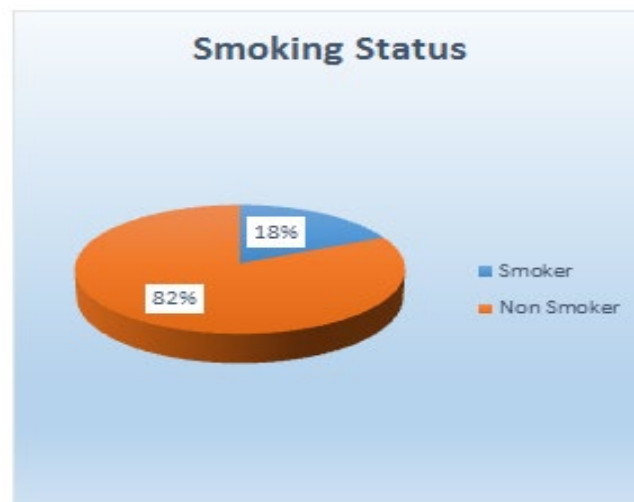


Figure 4: Distribution of participant as per their smoking status

### EPDS

The following results describe the most frequent answers given by participants regarding the EPDS statements: (Table 4)

- 47.5% of participants said that they have been able to laugh and see the funny side of things as much as they always could.
- 48.4% of participants said that they have looked forward with enjoyment to things rather less than they used to.
- 44.3% of participants said that they have never blamed themselves unnecessarily when things went wrong.
- 36.9% of participants said that they have been sometimes anxious or worried for no good reason.
- 39.3% of participants said that they have never felt scared or panicky for no very good reason.
- 34.4% of participants said that things have been sometimes getting on top of them.

- 40.2% of participants said that they have never been so unhappy that they have had difficulty sleeping.
- 36.1% of participants said that they have never felt sad or miserable.
- 38.5% of participants said that they have never been so unhappy that they have been crying.
- 95.9% of participants said that they have never thought of harming themselves has occurred to them.

Edinburgh Postnatal Depression Scale (EPDS) was developed to identify women who may have postpartum depression. Each answer is given a score of 0 to 3. The maximum score is 30.

The mean EPDS score was 10.94 over 30 with a minimum of 0 over 30 and a maximum of 25 over 30. (Table 5)

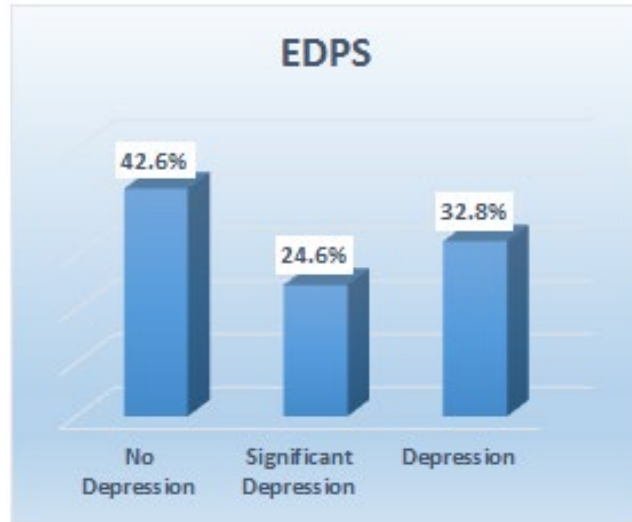
The EPDS results show that 32.8% of the participants have depression, 24.6% have a significant risk of depression and 42.6% have no depression. (Figure 5)

EPDS	Frequency	Percent
<b>1. I have been able to laugh and see the funny side of things</b>		
As much as I always could	58	47.5%
Not quite so much now	44	36.1%
Definitely not so much now	14	11.5%
Not at all	6	4.9%
<b>2. I have looked forward with enjoyment to things</b>		
As much as I ever did	42	34.4%
Rather less than I used to	59	48.4%
Definitely less than I used to	16	13.1%
Hardly at all	5	4.1%
<b>3. I have blamed myself unnecessarily when things went wrong</b>		
Yes, most of the time	32	26.2%
Yes, some of the time	21	17.2%
Not very often	15	12.3%
No, never	54	44.3%
<b>4. I have been anxious or worried for no good reason</b>		
No, not at all	30	24.6%
Hardly ever	17	13.9%
Yes, sometimes	45	36.9%
Yes, very often	30	24.6%
<b>5. I have felt scared or panicky for no very good reason</b>		
Yes, quite a lot	19	15.6%
Yes, sometimes	23	18.9%
No, not much	32	26.2%
No, not at all	48	39.3%
<b>6. Things have been getting on top of me</b>		
Yes, most of the time I haven't been able to cope at all.	36	29.5%
Yes, sometimes I haven't been coping as well as usual	42	34.4%
No, most of the time I have coped quite well.	15	12.3%
No, I have been coping as well as ever.	29	23.8%
<b>7. I have been so unhappy that I have had difficulty sleeping</b>		
Yes, most of the time	24	19.7%
Yes, sometimes	33	27.0%
Not very often	16	13.1%
No, not at all	49	40.2%
<b>8. I have felt sad or miserable</b>		
Yes, most of the time	31	25.4%
Yes, sometimes	20	16.4%
Not very often	27	22.1%
No, not at all	44	36.1%
<b>9. I have been so unhappy that I have been crying</b>		
<b>EPDS</b>		
Yes, most of the time	25	20.5%
Yes, quite often	16	13.1%
Only occasionally	34	27.9%
No, never	47	38.5%
<b>10. The thought of harming myself has occurred to me</b>		
Yes, quite often	1	0.8%
Sometimes	3	2.5%
Hardly ever	1	0.8%
Never	117	95.9%
<b>Total</b>	<b>122</b>	<b>100.0%</b>

**Table 4:** Distribution of participant as per the EPDS characteristics

	N	Mean	Median	Std. Deviation	Minimum	Maximum
<b>EPDS</b>	122	10.94	11.00	7.262	0	25

**Table 5:** Distribution of participant as per the EPDS score



**Figure 5:** Distribution of participant as per the EPDS score

**Bivariate Analysis**

There was no statistical significant correlation between the nationality of the participants and the depression status (Chi-Square test; p-value > 0.05). (Table 6)

There was no statistical significant correlation between the age of the participants and the depression status (ANOVA; p-value > 0.05). (Table 7)

There was no statistical significant correlation between the smoking status of the participants and the depression status (Chi-Square test; p-value > 0.05). (Table 8)

A statistical significant correlation exists between the type of the delivery and the depression status (Fisher Exact test; p-value = 0.048

< 0.05).The analytical analysis shows that women who underwent a C-section were more depressed (43%) comparing to women who underwent a normal delivery (29.8%). (Table 9)

There was no statistical significant correlation between the sex of the baby and the depression status (Chi-Square test; p-value > 0.05). (Table 10)

No statistical significant correlation exists between the pregnancy characteristics and the depression status (ANOVA test; p-value > 0.05). A statistical significant correlation exists between the patients' pregnancy days and the depression status (ANOVA test; p-value = 0.010< 0.05). The analytical analysis shows that women are at high risk of depression when the pregnancy duration is increasing. (Table 11)

		Depression			Total	P-Value
		No Depression	At Risk Of Depression	Depression		
Nationality	Lebanese	20 37.0%	18 33.3%	16 29.6%	54 100.0%	0.134
	Syrian	32 47.1%	12 17.6%	24 35.3%	68 100.0%	
Total		52 42.6%	30 24.6%	40 32.8%	122 100.0%	

**Table 6:** Distribution of participant as per their nationality and the depression status



		N	Mean	Std. Deviation	Minimum	Maximum	P-Value
Age	No Depression	52	28.83	5.07	19	42	0.088
	Risk of Depression	30	31.53	5.78	19	45	
	Depression	40	29.20	5.80	18	42	
	Total	122	29.61	5.56	18	45	

**Table 7:** Distribution of participant as per their age and the depression status

		Depression			Total	P-Value
		No Depression	At Risk Of Depression	Depression		
Smoking Status	Smoker	8	7	7	22	0.662
		36.4%	31.8%	31.8%	100.0%	
	Non Smoker	44	23	33	100	
		44.0%	23.0%	33.0%	100.0%	
Total		52	30	40	122	
		42.6%	24.6%	32.8%	100.0%	

**Table 8:** Distribution of participant as per their smoking status and the depression status

		Depression			Total	P-Value
		No Depression	At Risk Of Depression	Depression		
Delivery type	Normal Delivery	38	28	28	94	0.048
		40.4%	29.8%	29.8%	100.0%	
	C-Section	14	2	12	28	
		50.0%	7.1%	42.9%	100.0%	
Total		52	30	40	122	
		42.6%	24.6%	32.8%	100.0%	

**Table 9:** Distribution of participant as per the delivery type and the depression status

		Depression			Total	P-Value
		No Depression	At Risk Of Depression	Depression		
Sex Baby	Boy	26	13	13	52	0.242
		50.0%	25.0%	25.0%	100.0%	
	Girl	26	17	27	70	
		37.1%	24.3%	38.6%	100.0%	
Total		52	30	40	122	
		42.6%	24.6%	32.8%	100.0%	

**Table 10:** Distribution of participant as per the sex of the baby and the depression status

		N	Mean	Std. Deviation	Minimum	Maximum	P-Value
GPAL: Gravida	No Depression	52	3.06	2.04	1	9	0.082
	Risk of Depression	30	2.17	1.26	1	6	
	Depression	40	3.08	2.07	1	9	
	Total	122	2.84	1.92	1	9	
GPAL: Para	No Depression	52	1.96	2.00	0	8	0.165
	Risk of Depression	30	1.33	1.42	0	6	
	Depression	40	2.15	1.86	0	7	
	Total	122	1.87	1.84	0	8	
GPAL: Aborta	No Depression	52	.31	0.76	0	3	0.207
	Risk of Depression	30	.10	0.31	0	1	
	Depression	40	.38	0.70	0	2	
	Total	122	.28	0.66	0	3	
G Days	No Depression	52	268.83	7.90	242	283	0.010
	Risk of Depression	30	271.00	5.75	253	278	
	Depression	40	273.78	8.26	245	291	
	Total	122	270.98	7.80	242	291	

**Table 11:** Distribution of participant as per the sex of the baby and the depression status

## Discussion

### Demographic Characteristics

#### Nationality

The mother's nationality is not frequently investigated as a predictor of postpartum depression. In our study, Lebanese and Syrian mothers did not exhibit significant differences in the presentation of postpartum depression.

Similarly, a study investigating postpartum depression among Lebanese women found no significant association between the mother's nationality and the EPDS score at day 2 and 30-40 postpartum. It can therefore be deduced that Lebanese mothers were not more likely to be depressed when assessed at different time points after delivery than non-Lebanese mothers<sup>[56]</sup>.

#### Smoking status

The present study found no significant correlation between maternal smoking and postpartum depression. This was inconsistent with a study conducted in Nepal, which found a significant association between smoking and postpartum depression. In fact, mothers who were smokers were significantly more likely to have high EPDS scores<sup>[49]</sup>. In other words, smoking was correlated with post-partum depression in this population.

#### Delivery type

Our study established a significant correlation between delivery type and postpartum depression and found that women who delivered by C-section are more likely to be depressed, while those who delivered naturally were at a higher risk to be depressed. Interestingly, results from a Lebanese study showed that C-section actually decreased the risk of postpartum depression assessed 3 to 5 months after delivery. Inconsistently with our findings, women who delivered vaginally had significantly higher rates of postpartum depression<sup>[57]</sup>.

On the other hand, a Moroccan study investigating the potential association between delivery type and postpartum depression and could not establish statistical significance. Women who delivered by caesarian section, or by natural vaginal delivery actually showed equal rates of postpartum depression<sup>[46]</sup>, as opposed to our study.

#### Baby gender

A study in Nepal investigated the correlation between postpartum depression and a variety of social and clinical factors. It was consequently found that the baby's gender was not significantly associated with post-partum depression<sup>[49]</sup>. Mothers of girls and those of boys had thus comparable risk to develop depression after delivery, consistently with our study. These results were also reflected in a Lebanese study investigating postpartum depression, which was not significantly correlated with baby gender at both 2 days and 30 to 40 days after delivery<sup>[56]</sup>.

That being said, researchers have determined that delivering a female baby was a significant predictor of postpartum depression among Jordanian mothers<sup>[48]</sup>. This is most likely a reflection of Arab culture, in which male babies are valued and desired more than female babies. Mothers are therefore often pressured into delivering a male baby in order to ensure a family heir and the continuation of the family line.

#### Age

Our study found no significant association between age and postpartum depression. When consulting the literature, maternal age emerged as a non-significant predictor of postpartum depression. This was validated in a study conducted among mothers in Nepal which found no association between maternal age and an EPDS score greater than 12<sup>[49]</sup>. This was consistent with a Lebanese study, where age was not a significant predictor of postpartum depression 2 and 30-40 days after delivery, as determined by an EPDS score greater than 9<sup>[56]</sup>.

### Gravida and Parity

No significant correlation emerged in our study between gravida or parity and postpartum depression. This was consistent with a meta-analysis of the causative factors associated with postpartum depression. In fact, it was established that the number of children and gravida were not significant predictors of postpartum depression<sup>[35]</sup>. Evidence from Morocco also established the lack of significant relationship between parity and postpartum depression<sup>[46]</sup>. Primiparous women, i.e. women who are giving birth for the first time, were not found to be significantly more likely to be depressed after delivery. The number of children was also investigated and did not significantly affect the incidence of postpartum depression in the sample of Moroccan mothers. A study in Indonesia similarly found comparable parity in mothers who suffered from postpartum depression and those who did not<sup>[47]</sup>. Evidence from Lebanon also validated our results through the established non-significant association between primiparity and multiparity and the detection of postpartum depression<sup>[56,57]</sup>.

On the other hand, multiparity was associated with higher EPDS scores among mothers in Nepal. In fact, women with 4 or more children were more likely to exhibit depression after delivery, as reflected by a high score on the EPDS<sup>[49]</sup>.

### Abortion

A history of spontaneous abortion was actually associated with depression and anxiety in pregnant women, as opposed to our results. This was established in a study investigating quality of life and mental health in pregnant Iranian women. It was consequently found that women who have experienced abortions had impaired quality of life as well as mental health when compared to women who had no such experiences<sup>[51]</sup>.

### Gestation period

In our study, longer gestation was significantly associated with postpartum depression.

Researchers in Lebanon were actually unable to establish a statistically significant correlation between gestational weeks or pregnancy term and postpartum depression<sup>[56,57]</sup>. More specifically, Women who had less than 36 weeks of gestation, between 36 and 40, as well as over 40 weeks of gestation were thus equally likely to exhibit depressive symptoms when assessed for postpartum depression<sup>[56]</sup>.

### Impact Of The Study

Postpartum depression (PPD) is a significant health problem, it is estimated that depression costs the United States 30 billion dollars to 50 billion dollars in lost productivity and direct medical costs each year. The longer a woman is incapacitated by PPD, the more she is at risk for lifelong and recurrent depression and suicide, and if left Untreated it may seriously damage the mother-infant relationship and result in cognitive, emotional, and behavioral deficits in her growing child<sup>[5]</sup>. Therefore, postpartum depression screening must be mandatory in our country to reduce the psychological damage and its deadly effect (suicide, evolving to psychosis ...) and in turn cost reduction in a developing country (similar to Lebanon) especially after the large influx of Syrian refugees.

### Study Limitations

The present study was not without its limitations. Although it was a prospective study, only 122 patients were included and recruited from select regions. Further studies could aim to include a higher number of patients from all geographical regions in Lebanon. This would ensure higher representability of the results and would therefore better reflect the pregnancy in the Lebanese community.

## Study Perspectives

The present study aimed to identify the prevalence of the postpartum depression during the first 2 weeks postpartum. It was shown that 32.8% of women have depression and that the depression was correlated with the pregnancy duration and the type of delivery (C-Section). Further investigational studies should be enrolled in order to provide women with psychotherapy support during the pregnancy and especially long pregnancies and pregnancy where the prognostic of the delivery is known to be C-Section.

## Conclusion

The current study established the significant correlation between postpartum depression and delivery type as well as gestation period. Other investigated variables, namely nationality, smoking status, baby gender, age, gravida, parity, and abortion, did not reach statistical significance in the present research.

The inconsistencies observed between our results and those reported in different studies that were conducted in comparable low to middle-income countries highlight the necessity of establishing national Lebanese postpartum data. This is important considering the heterogeneity of the characteristics and risk factors of postpartum depression across countries, possibly due to cultural and socioeconomical differences.

That being said, the results reported in our study could serve for the modification and improvement of clinical practice for the prevention and treatment of postpartum depression. Clinicians could thus implement screening interventions as well as educational sessions for the prevention of depression in Lebanese mothers, especially those choosing to deliver through C-section.

Moreover, women with longer gestational periods can be closely monitored for the appearance of depressive symptoms. This would ensure the early detection and management of postpartum depression in this high-risk cohort and the prevention of the deleterious effects of this disorder.

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