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Postpartum Depression and Maternity Blues in Immigrants

Fragiskos Gonidakis

*University of Athens, Medical School, 1st Psychiatric Department,
Greece*

1. Introduction

Over the last decades the phenomenon of economic migration has increased significantly. The majority of immigrants are leaving their country mainly in order to improve their quality of life and work conditions.

A number of studies identify significantly elevated levels of psychological distress among immigrants than non-immigrant population (Mirsky, 2008, Taloyan et al, 2008). International migration has been characterized as a stressful life-event that causes an overburdening of the 'psychosomatic adjustment capacity', leading to higher emotional distress, diminished well-being and illness (Hull, 1979). The elevated psychological distress can affect directly the immigrants' everyday life leading to higher alcohol use, lower quality of life or even suicide ideation (Daher et al, 2011; Lindert et al, 2008). Most of the studies assessing immigrants' psychopathology have not focused on discrete psychiatric disorders but on general psychological distress, which includes anxiety, depressive feelings and somatisation. In a telephone survey conducted in Israel, 52% of adult immigrants reported depressive symptomatology compared to 38% of non-immigrants (Gross et al, 2001). Also, immigrant women were one-and-a-half times more likely than Israel born women to suffer from anxiety disorders (Mirsky et al, 2008). Furthermore, immigration as well as the adaptation process to the mainstream culture of the new country has been linked to mental disorders and especially depression (Gonidakis et al, 2011; Madianos et al, 2008, Sam, 2006a).

It has been well documented that immigration constitutes a stress factor that may influence the emotional status of women after delivery. Ozeki (2008) has reported that isolation, language and cultural barriers, and raising their children in a different cultural environment were the main stressors that Japanese mothers living in the United Kingdom were facing. Also Taniguchi and Baruffi (2009) have found that language barrier, distance from family and friends, different culture, and health-care attitude regarding childbirth were the stress factors reported by women from Japan who gave birth in Hawaii. A study conducted in Australia showed that immigrant women were more likely than Australian-born women to be breastfeeding at six months and were equally confident in caring for their baby and talking to health providers. No differences were found in anxiety or relationship problems with partners. However, compared with Australian-born women, immigrant mothers less

proficient in English did have a higher prevalence of depression and were more likely to report seeking more practical and emotional support. They were more likely to have no 'time out' from baby care and to report feeling lonely and isolated (Bandyopadhyay, 2010).

Although there has been mounting research in mental disorders in the puerperium and especially postpartum depression, little focus has been placed on immigrant women (Fung and Dennis, 2010). This is a significant limitation given the continuous growth of the immigration movement and the changing demographics in North America and Europe. In Greece within two decades the percentage of the population that was born in another country has increased rapidly due to vast arrivals of immigrants from a large number of geographical areas such as the Balkans (Albania and Bulgaria), Eastern Europe (Poland, former USSR countries), Western and Eastern Africa (Nigeria and Ethiopia), and Western and Central Asia (Iraq, Afghanistan, Pakistan and Bangladesh). Most of these people have decided to immigrate for political, financial, and/or personal reasons, such as domestic violence or divorce. It is estimated that about 10% of the inhabitants of Athens are first generation immigrants. Furthermore, an unknown number of immigrants remain in Greece for only a short time, as their final destination is Central Europe or North America (Gonidakis et al, 2011).

2. Postpartum depression and immigration

Postpartum depression is one of the most common complications of childbearing. Most studies on postpartum depression have been conducted in developed countries and have reported a prevalence rate between 10-15% (Mann et al, 2010). Even though it has been suggested that postpartum depression might be more frequent in urban westernized societies, recent studies in non-western countries showed that postpartum depression has similar prevalence rates in different societies around the globe (Halbreich and Karkun, 2006). An international study that explored levels of postpartum depression in nine countries representing five continents showed that European and Australian women had the lowest levels, US women had intermediate and women from Asia and South America had the highest level of depressive symptoms (Affonso et al, 2000).

2.1 Prevalence rate of postpartum depression among immigrants

A growing body of research suggests that immigrant women may have higher rates of postpartum depression (Fung and Dennis, 2010). Steward et al (2008) have reported that postpartum depression occurred more often in immigrant, refugee and asylum seeking women than in native Canadian women. In a recent study conducted also in Canada Miskurka et al (2010) found that immigrant women had a higher prevalence of depressive symptomatology independently of time since immigration. Mechakra-Tahiri et al (2007) have reported that in a study among immigrant women in Canada the prevalence of high depressive symptoms was larger among immigrants from minority groups than among immigrants from majority groups and Canadian-born mothers. Similar results have also been reported by Zelkowitz et al (2008).

However, there are studies in the literature that found lower frequency or no difference in the rates of postpartum depression among immigrant and native populations. Bjerke et al (2008) reported lower rates of postpartum depression in Pakistani women living in Norway.

The authors suggest that this result could be attributed to cultural differences in the perception of depressive symptomatology as mental illness, the presence of family members during the interview and the use of measurements in Norwegian rather than 'Urdu', the official Pakistani language. Davila et al (2009) found lower rates of postpartum depression in foreign-born Hispanic mothers living in USA when they were compared to US-born mothers. Finally, Kuo et al (2004) found that postpartum depression prevalence was not associated with the immigration status in a sample of Hispanic mothers living in USA.

The contradictory results from these studies highlight the complex interplay of social and cultural factors that may affect the risk of postpartum depression among immigrant women (Bhugra, 2003; Fung and Dennis, 2010).

2.2 Risk factors for postpartum depression among immigrant women

A number of reviews and meta-analyses suggest a multifactorial etiology for postpartum depression. The most common predictive factors are: previous history of depression, manifestation of maternity blues the first days after delivery and poor social and marital support (Beck, 2001, Robertson et al, 2004).

Similar factors have been related to the development of postpartum depression in immigrant mothers. Specifically, the relation of social support and the development of postpartum depression has been extensively investigated in immigrant populations. Stuchbery et al (1998) have conducted a study on social support and postpartum depression in a sample of Vietnamese, Arabic and Anglo-Celtic mothers living in Australia. The authors found that for Vietnamese mothers low postnatal mood was associated with poor quality of the relationship with the partner and a perceived need for more practical help from him. For Arabic women low postnatal mood was associated with perceived need for more emotional support from partners while for Anglo-Celtic women the need for emotional support was directed both to the partner and the woman's mother. Steward et al (2008) have reported that immigrant women with less prenatal support were more likely to develop depressive symptomatology after delivery. The authors suggest that lower social support could be the factor that increases the risk for postpartum depression in newcomers.

Prenatal depressive and somatic symptoms as well as marital quality were the best predictors of postpartum depressive symptomatology in immigrant women living in Canada (Zelkowitz et al, 2008). Miszkurka et al (2010) found that the region of origin was a strong predictor of depressive symptomatology: women from the Caribbean, South Asia, Maghreb, Sub-Saharan Africa and Latin America had the highest prevalence of depressive symptomatology compared to Canadian-born women. The higher depression odds in immigrant women were attenuated after adjustment for lack of social support and financial difficulties. Time trends of depressive symptoms varied across origins. In relation to length of stay, depressive symptoms increased (European, Southeast Asian), decreased (Maghrebian, Sub-Saharan African, Middle Eastern, East Asian) or fluctuated (Latin American, Caribbean). Furthermore, self-reported health, health beliefs, access to health care and adaptation to a new environment were four key themes reported by Asian immigrant women in Taiwan who had developed postpartum depression (Huang and Mathers, 2008).

Finally it should be noted that many immigrant women have experienced extremely traumatizing events prior to immigration as well as stressful conditions during and after

immigration. Some of these conditions are: lack of legal residence in the host country, unemployment, poor housing conditions and lack of autonomy. A qualitative study conducted among Asian mothers living in Canada showed that the migration experience as well as post-immigration stress was related to depressive symptomatology (Morrow et al, 2008). It is interesting that some of the women that were interviewed attributed the distress that they were experiencing to inadequate support from their husbands. In their home countries these women would first turn to their mothers and female relatives for support. After immigration the husband was usually the only person they could ask for help. But the husbands seemed to be ill-prepared for this change of their traditional role and in many cases they were unable to fulfill their wives' expectations (Morrow et al, 2008).

2.2.1 Acculturation and postpartum depression

A recurrent issue in studies on immigration and mental health is the role of culture as a health risk or protective factor, particularly the phenomenon of acculturation (Berry, 2006; Bhugra, 2004a, 2004b). In 2004, The International Organization for Migration defined acculturation as "the progressive adoption of elements of a foreign culture, ideas, words, values, norms, behaviors, institutions by persons, groups or classes of a given culture" (Sam, 2006a).

One fundamental issue in acculturation research is dimensionality. Two major models have been introduced in the literature (Sam, 2006a). The unidimensional model proposes that when an immigrant adopts elements of a mainstream culture, he/she moves away from his/hers own heritage culture (LaFromboise et al, 1993). In this model, acculturation and assimilation processes are viewed as similar (Bhugra, 2004a). The bidimensional model assumes that it is possible for an immigrant to acquire elements of the mainstream culture without losing his/her original culture (Berry, 1980). The bidimensional model separates heritage and mainstream acculturation as two processes that coexist in two different dimensions (Sam, 2006a).

Regardless of the model used to study and comprehend acculturation, a considerable amount of stress can arise as a result of immigrants' continuous and sometimes unsuccessful effort at social integration and acceptance by the mainstream culture (Berry, 2006). This effort includes learning the language and lifestyle of the mainstream culture, struggling to come to terms with homesickness and adaptation to the new country, overcoming financial and professional difficulties, or trying to function within a "new meaning" system. Furthermore, it is well established in the literature that chronic stress, such as acculturative stress, is linked with the manifestation of mental disorders, especially depression (Bale, 2006).

Previous studies have demonstrated an ambiguous relationship between acculturation and mental health, especially depressive mood (Sam, 2006b). The interplay between acculturation stress and postpartum depression has not been investigated extensively. In the literature there is only a small number of studies reporting contradictory results. Davila et al (2009) showed that higher acculturation in Latino mothers living in USA was associated with higher rates of postpartum depression. Abbot and Williams (2006), utilizing the bidimensional model of acculturation, showed that marginalized (low orientation to both host and heritage culture) Pacific Island women living in Australia had a significant higher

risk of developing postpartum depression. Contrary to these results a study conducted in Hmong mothers living in the USA (Foss, 2001) and a study conducted in a population of immigrant mothers living in Canada (Zelkowitz et al, 2008) reported higher rates of postpartum depression in less acculturated mothers. It is interesting that a number of studies did not find any consistent relationship between acculturation and postpartum depression (Beck et al, 2005; Kuo et al, 2004).

The interpretation of these results needs to consider the complex nature of acculturation, the lack of widely accepted definition and measurements as well as the discrepancies among cultures and countries that may inhibit the generalizability of each study's results.

2.2.2 Postpartum depression and traditional rituals in immigrants

Traditional rituals concerning the puerperium exist in most cultures. Common practices include support for the mother, restricted activity, specific dietary and hygiene prescriptions that last about a month to forty days (Fung and Dennis, 2010, Grigoriadis et al, 2009). An example of traditional ritual is the Japanese 'Satogaeri bunben'. 'Satogaeri' means returning to the original family town or house and 'bunben' means delivery. What actually happens is that the new mother after delivery returns for a period of 40 days to her mother's home so that she can be helped and cared by the older and more experienced woman. 'Satogaeri bunben' has not been found to lower the incidence of postpartum depression (Yoshida et al, 2001). A recent review on traditional postpartum rituals concluded that "there is some evidence that postpartum rituals dictating appropriate and wanted social support may be of some protective value, depending on numerous contextual factors" (Grigoriadis et al, 2009).

2.3 Barriers to research and identification of postpartum depression in immigrant populations

The research and identification of postpartum depression in immigrant populations is challenged by a number of factors:

1. The results from each study are difficult to be generalized. The factors that influence the development of postpartum depression in Mexican American women are not necessarily the same as the ones that have an impact on Albanian women living in Greece.
2. The use of scales to measure postpartum depression. There are three concerns regarding the issue of using translated instruments in transcultural studies (Nguyen et al., 2007). Specifically: (a) the instrument may fail to capture the conceptualization of postpartum depression in different cultural groups, (b) the instrument may include items that are irrelevant to the expression of postpartum depression in other cultural groups than the one for which it was designed, (c) factors such as social stigmatization, ethnicity, gender and age of the interviewer, and the setting of the interview may influence the way people respond.
3. Finally, a third limitation is the language barrier (Bhui and Bhugra, 2001). This is not only related to the level of knowledge of the host country's language, but also to semantic differences in the usage of the same words by people coming from different linguistic and cultural backgrounds.

3. The transcultural aspect of maternity blues

Maternity blues is a mild and transient phenomenon characterized mainly by feeling tearful, tired, anxious, forgetful, muddled, overemotional, changeable in mood, and low spirited, that occurs during the first days of puerperium (Gonidakis et al, 2007). Reports of the phenomenon exist since the late 19th century (Savage, 1875). In the early 50's, Moloney (1952) described a mild depressive reaction after delivery characterized by bursts of tears, fatigue and difficulty in thinking, which he named "third day depression" while in the 70's Pitt (1973) introduced the term "Maternity Blues". Although benign in nature maternity blues has been linked with the occurrence of postpartum depression, a mood disorder with substantial influence on the mother's welfare and the child's rearing (Darcy et al, 2011; Gonidakis et al, 2008).

Despite the large number of studies on mood disorders after delivery there is still no standard definition of maternity blues. The lack of diagnostic criteria, as well as the differences in the research methodology, are two of the main reasons for the wide range of prevalence rates that has been reported in various studies. Thus, the prevalence of maternity blues has been reported as high as 83% in a study from Tanzania (Harris, 1981) and as low as 8% in a study from Japan (Tsukashaki et al, 1991). Most of the authors agree that the prevalence of maternity blues varies between 40-60% (Hay and Levy, 2003; Nagata et al, 2000).

The fact that a number of studies reporting low prevalence of maternity blues are coming from Japan (Murata et al, 1998; Tsukashaki et al, 1991; Yoshida et al, 1997) has also raised the issue of cultural differences and especially the influence of culture in family support during puerperium. Nagata et al (2000) explored the effect of traditional support (satogaeri bunben) that Japanese women receive after delivery but found no correlation with the occurrence of maternity blues.

Although there are authors that have suggested that maternity blues is a cultural-bound syndrome that is observed mainly in western-type cultures where the traditional supportive rituals regarding the period of puerperium have subsided (Ugarizza, 1992), there has not been any conclusive evidence yet that the occurrence of maternity blues is related to socio-cultural factors (Kumar, 1994).

So far a number of psychosocial parameters have been tested in order to establish the risk factors of maternity blues. Most of the studies did not find any relation between the manifestation of the phenomenon and sociodemographic factors such as age, education, occupation and marital status (Nagata et al, 2000; O'Hara et al, 1991). Unwanted pregnancy, parity, caesarean section, breastfeeding and family support have also been tested but with contradictory results (Hensaw et al, 2003; Gonidakis et al, 2007). Negative emotions such as anxiety, fear of giving birth, and depression as well as stressful life events during pregnancy have been related to maternity blues (Bergant et al, 1998; Gonidakis et al, 2007; O'Hara et al, 1991; Pop et al, 1995).

4. Maternity blues and postpartum depression in a sample of Albanian women living in Athens, Greece

The present study, which was part of a larger study on maternity blues and postpartum depression in Greece (Gonidakis et al, 2007, 2008), attempts to investigate primarily maternity blues and postpartum depression in first generation immigrant mothers

compared to a sample of native Greek women and secondly clinical and sociodemographic factors that are related with the occurrence of maternity blues and postpartum depression in immigrants. According to the literature review and the author's clinical experience acquired by treating immigrants, more immigrant than Greek women were expected to experience depressive symptomatology. Since, according to the author's knowledge, there are no other studies in the literature, that have dealt with the issue of maternity blues in immigrant mothers, the study had an exploratory nature and there was no hypothesis formulated prior to the investigation.

4.1 Methodology

The present cross-sectional study consists of two arms. The first concerns the prevalence of maternity blues during the first three days of puerperium and postpartum depression during the first three months after delivery as well as the factors related with the manifestation of these two mood disorders of the puerperium. The second arm concerns the comparison between two ethnic groups, an immigrant and a native Greek. The immigrant group consisted of women coming from Albania. The reasons behind this choice were two. The first was that Albanian immigrants is the largest immigrant group in Greece and the second is that Albanians and Greeks are two nations residing in the Balkan area in great cultural proximity, sharing many common customs and rituals concerning the period of pregnancy and puerperium.

4.1.1 Participants

The study was conducted at the 1st Obstetrics and Gynecology Department of University of Athens, Medical School. The first 100 immigrant women, who consecutively gave birth in the department, were approached and examined the first day after delivery.

The inclusion criteria were adequate knowledge of the Greek language (to be able to speak and read in Greek), birth of a healthy child (Apgas score of 9-10), absence of personal history of psychotic disorder, use of psychoactive substances and chronic somatic disease. Also women that were suffering from depression at the time of the first examination (score higher than 20 in the Montgomery-Asberg Depression Rating Scale (Montgomery and Asberg, 1979) were excluded from the study. The above was decided in order to avoid misdiagnosing antenatal depression as postpartum depression or maternity blues.

Each immigrant woman that was included in the study was paired according to age (\pm 1year), socio-economic status and primiparity with a Greek woman that gave birth the same time period in the same maternity ward. In order to avoid selection bias the women were paired in chronological order so the first ethnic Albanian woman who was included in the study was matched with the first suitable Greek women who agreed to participate in the study and so on. To define the women socio-economic status the Madianos and Zarnari Social and Economical Status Scale was used (Madianos and Zarnari, 1988). According to this scale, women were grouped into three major categories: low (farmers, labourers and blue collar workers), medium (technicians, self-employed persons, medium employees, small and medium sized shop owners) and upper status (scientists, executives, high ranking corporate employees). Primiparity was selected as a matching variable because results from earlier studies showed a correlation of primiparity with the manifestation of maternity blues

(Pop et al, 1995). It should be noted though that newer studies did not report similar results (Hay and Levy, 2003, Gonidakis et al, 2007).

4.1.2 Data collection

Demographic and clinical data concerning pregnancy, delivery and puerperium were collected by questionnaire as well as from the women's medical records.

The first day after delivery all women were asked to complete the State Trait Anxiety Inventory (Spielberger et al, 1970) and the List of Threatening Experience (Brugha et al, 1985) for the period of pregnancy. All the above questionnaires were self-administered. Finally the Montgomery Asberg Depression Rating Scale (Montgomery and Asberg, 1979) was completed by the author following a 20 minutes face-to-face interview during which the participants's emotional status during the last month was discussed.

All women were asked to complete the Kennerley and Gath (1989) Blues Questionnaire every evening for the first 3 days following delivery. The face-to-face interviews were limited to the first 3 days of puerperium as this was the minimum time that the women stayed in the hospital after delivery. Although the above questionnaires were self-administered the author was always available to offer assistance on the scale's questions.

At the end of the 1st month and 3rd month all women were interviewed by telephone. During these interviews the Edinburgh Postnatal Depression Scale (Cox et al, 1987) was administered. We also recorded whether the women were breastfeeding, and if according to their judgment their babies were crying a lot and/or having a poor sleep.

In the case of a participant reporting symptoms of depression further psychiatric evaluation was suggested. All women gave written informed consent in order to participate in the study and they provided the author with their telephone numbers in order to reach them after their discharge from the maternity ward

4.1.3 Measures

For the purposes of the study the following measures were used:

- a. Blues Questionnaire (Kennerley and Gath, 1989) was used to measure maternity blues. The Blues Questionnaire (BQ) is a validated self-rating scale consisting of 28 questions concerning the emotional state after delivery. The available answers are "yes" or "no" so the maximum score is 28 and the minimum 0. For the calculation of the cut-off point for severe maternity blues the authors suggest that the mean peak score of all women should be used. The highest score on any of the days of observation is considered the peak score for each participant. For the present study the mean peak score was 8.4 so the cut off point for the diagnosis of severe maternity blues was the score of 9. It should be noted that the B.Q. was translated, back translated and adapted in Greek for the purposes of a previous study on maternity blues (Gonidakis et al, 2007).
- b. The Edinburgh Postnatal Depression Scale (EPDS) was produced by Cox et al, (1987). It consists of 10 items with four possible answers for each item. The score for each item varies from 0 to 3 so the maximum score is 30. The EPDS has been translated in many languages and used worldwide as a reliable screening instrument for postnatal

- depression (Gibson et al, 2009, Halbreich and Karkun, 2006). The validation of the Greek edition of EPDS was conducted by Leonardou et al (2009) who calculated the cut off point for the diagnosis of postnatal depression at 11/12. When the Greek version of EPDS was administered together with SCID, it produced a sensitivity of 90% and a specificity of 97.22% (Leonardou et al, 2009). For the present study a cut off point of 12 was used.
- c. Montgomery-Asberg Depression Rating Scale (MADRS) (Montgomery and Asberg, 1979) is a semi structured 10item scale. The MADRS focuses more on the psychic manifestations of depression rather on the somatic ones and thus is more suitable for the measurement of depression in women that due to pregnancy and delivery are experiencing a lot of somatic disturbances that resemble the somatic symptoms of depression. The MADRS have been translated, back translated and adjusted in Greek by other research groups in University of Athens.
 - d. The List of Threatening Experience (L.T.E.) is a 12item scale of stressful life events created by Brugha et al (1985) that have been used successfully in puerpartum studies (Gonidakis 2007, 2008; Yamashita et al, 2000). The same procedure that was followed with the B.Q. for the translation and adjustment of the scale in the Greek language has also been followed with LTE
 - e. The State-Trait Anxiety Inventory (STAI) is a widely used self rating scale produced by Spielberger et al (1970) that consists of two 20 items subscales measuring anxiety as state and trait. The scale has been translated and validated for the Greek language (Liakos and Gianitsi, 1984)
 - f. Demographic and clinical data concerning pregnancy, delivery and puerpartum were collected by questionnaire as well as from the participant's medical records

4.1.4 Analysis

Chi-square was used to compare nominal variables. Two-tailed paired samples t-test was used to compare mean scores of scale variables between the Albanian and Greek group. A Kolmogorov-Smirnov Z test was run prior to the analysis to detect differences in the locations and shapes of the distributions between the two groups measurements. Since the test did not show any significant differences in BQ 3rd day ($Z=0.5$, $p= 0.9$), EPDS 1st month ($Z=0.7$, $p= 0.8$), or MADRS ($Z=0.8$, $p=0.6$) distributions paired samples t-test was performed. One way Analysis of Variance (ANOVA) test was used, to compare the daily BQ scores between immigrant and Greek women in the Maternity Blues and non Maternity Blues group as well as the EPDS scores between immigrant and Greek women in the Postpartum Depression and non Postpartum Depression group. Forward binary logistic regression analysis was used to further investigate factors that differentiate the two national groups as well as to investigate factors that were related with maternity blues and postpartum depression in immigrant women. Also for each regression analysis a Hosmer-Lemeshow test was run in order to test whether the model produced by regression analysis has goodness of fit. Finally the value of Nagelkerke R square was calculated as an indication of the predictability of the model produced by regression analysis.

The research design was approved by the relevant ethical and scientific committee of University of Athens, Medical School, 1st Department of Psychiatry.

4.2 Results

Twenty-two of the total 100 immigrant women were excluded from the study leading to a response rate of 78%. Nine of the 22 women (40.9%) could not speak and/or read Greek, 5 (22.7%) refused to participate and 1 (4.5%) was found suffering from depression in day 1 (MADRS >20). Seven (31.9 %) immigrant women could not be matched with a Greek counterpart so they were excluded from the study. In addition 5 Greek women refused to participate in the study and 2 were excluded because they were suffering from depression in day 1 after delivery. The sample characteristics are summarized in table 1:

Variables		Immigrant		Greek	
		F	%	F	%
Demographic and social					
Age	18-20	6	7.7%	7	5.1%
	21-25	32	41%	27	34.6%
	26-30	27	34.6%	30	38.5%
	>30	13	16.7%	14	21.8%
Education Level	Primary	8	10.3%	6	7.7%
	Secondary	55	70.5%	53	68%
	Tertiary	15	19.2%	19	24.3%
Marital status	Married	75	96.2%	76	97.4%
Years of marriage	1-5	56	71.8%	62	79.5%
	>5	22	28.2%	16	20.5%
Socio-economic Status	Low	59	75.7%	59	75.7%
	Medium	18	23.1%	18	23.1%
	Upper	1	1.3%	1	1.3%
Residence in Greece	1year	1	1.3%		
	2-5 years	54	69.2%		
	>5 years	23	29.5%		
Occupation	Working	52	66.7%	48	61.5%
Pregnancy and delivery					
Abortions	0	71	91%	64	82.1%
	>1	7	9%	14	17.9%
Primiparity	yes	46			59,00%
Unwanted pregnancy	Yes	7	9%	16	20.5%
Method of delivery	Natural birth	53	67.9%	44	56.4%
	Cesareanotomy	25	32.1%	34	43.6%
Puerperium					
Intention to breastfeed	Yes	75	96.2%	69	88.5%
Support from family	Yes	41	52.6%	51	65.4%
Advice	Yes	53	67.9%	66	84.6%
Peer support	Yes	49	62.8%	48	61.5%

Table 1. Sample characteristics. F: frequency

4.2.1 Differences between immigrant and Greek women

The two groups of women were quite similar. When they were compared to each other only two differences emerged. The first was that immigrant women reported lower number of

abortions than Greek women ($p=0.04$) (table 1&2). The second was that lower number of immigrant women reported that they would be able to consult a family member or friend or issues concerning rearing the child ($p=0.01$) (table 1&3).

Variables	Immigrant N=78		Greek N=78		Paired samples t-test		
	mean	sd	mean	sd	t	df	p
Demographic and social							
Years of marriage	4.2	3.2	3.6	3.3	1.3	77	0.2
Years of education	12	1.9	11.5	2.6	1.4	77	0.2
Medical							
Number of abortions	0.1	0.3	0.2	0.5	2	77	0.04
Number of stillbirths	0.2	0.5	0.2	0.3	1.1	77	0.3
Clinical Measurements							
MADRS 1 st day	6	5,9	6,8	5,6	10.9	77	0.3
STAI trait	29.1	6.1	28.8	7.4	0.2	77	0.8
STAI state	31.3	7.3	33.9	9.5	1.6	77	0.1
LTE	1.2	1.2	1.5	1.2	1.5	77	0.2

sd: standard deviation, df: degrees of freedom, p:level of significance

Table 2. Comparison between immigrant and Greek women. Scale variables

Variables	Chi Square		
	X ²	df	p
N=156			
Demographic and social			
Marital status	0.2	1	0.6
Employment status	0.5	1	0.5
Pregnancy and delivery			
Unwanted pregnancy	3.5	1	0.06
Method of delivery	2.2	1	0.1
Puerperium			
Intention to breastfeed	3.3	1	0.07
Support from family	2.7	1	0.1
Advice on upbringing the child	6	1	0.01
Peer support	0.03	1	0.9

df: degrees of freedom, p:level of significance

Table 3. Comparison between immigrant and Greek women. Nominal variables

4.2.2 Maternity blues

When the cut-off point of 9 was applied, 13 (16.7%) of the 78 immigrant and 14 (17.9%) of the 78 Greek women experienced maternity blues the 1st day after delivery. Accordingly, 12 (15.4%) immigrant and 14 (17.9%) Greek women experienced maternity blues the 2nd day after delivery and finally 17 (21.8%) immigrant and 19 (24.4%) Greek women experienced maternity blues the 3rd day after delivery. During the first three days after delivery 18

(23.1%) immigrant and 27 (34.6%) Greek women in total experienced maternity blues. There was no statistical significant difference between the two groups considering the percentage of the women that developed maternity blues in each and any of the three days of puerperium (table 4)

Variables	Chi Square		
	X ²	df	p
N=156			
1 st day	0.45	1	0.8
2 nd day	0.2	1	0.7
3 rd day	0.1	1	0.7
Any of the 3 days of observation	2.5	1	0.1

sd: standard deviation, df: degrees of freedom, p:level of significance

Table 4. Comparison between immigrant and Greek women that developed Maternity Blues

The daily fluctuation of the BQ score in the group of women who developed maternity blues and in the group of women who did not develop maternity blues in any of the three days of observation is represented in figure 1.

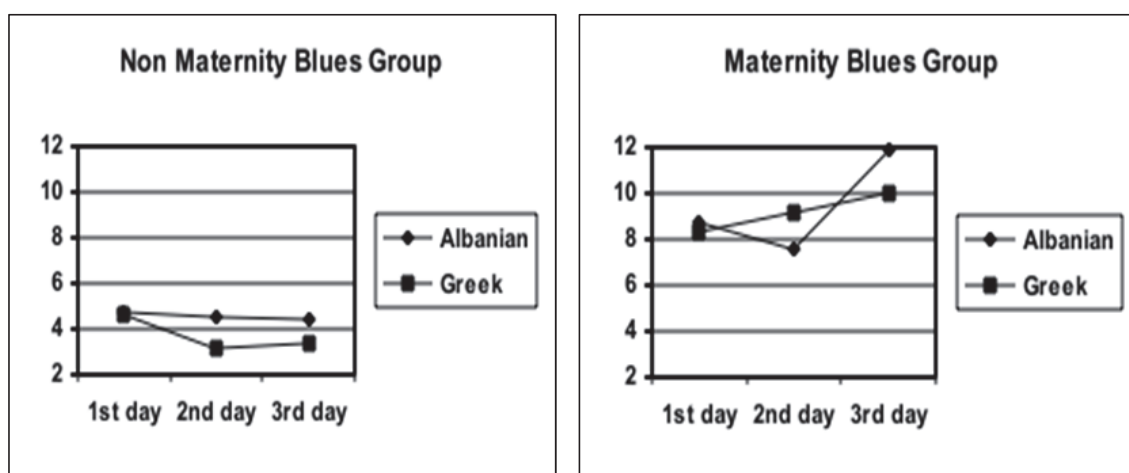


Fig. 1. Daily BQ's mean score variation in both the Maternity Blues and non Maternity Blues Groups

The comparison of the daily BQ scores between immigrant and Greek women in the Maternity Blues group did not show any difference. The comparison of the daily BQ scores in the non-Maternity Blues group showed higher scores for the immigrant group during the 2nd (p: 0.001) and 3rd day (p: 0.02) measurements (table 5).

Forward stepwise logistic regression analysis was used in order to confirm the findings for the Maternity Blues and non Maternity Blues groups. The BQ score for each day together with MADRS score, number of abortions and consultation on rearing the child (categorical variable) were entered as independent variables. For the MB group no difference was found between immigrant and Greek women. For the non MB group 2nd day BQ score (p: 0.01, odds ratio: 1.4) and consultation on rearing the child (p: 0.05, odd ratio: 0.4) were the two factors that could differentiate immigrant and Greek women thus verifying that even when the two demographic differences between Albanian and Greek women were taken into

consideration maternity blues symptomatology was still more severe during the 2nd day after delivery in the group of immigrant women that did not experience maternity blues. The significance level of the Hosmer-Lemeshow test ($p:0.4$) and the value of Nagelkerke R square (0.18) indicate that the model produced by regression analysis has goodness of fit, and it can predict around 18% of nationality variance.

Variables	One way ANOVA	
	F	p
Maternity Blues group		
1 st day	0.09	0.8
2 nd day	1,2	0.3
3 rd day	2,6	0.1
Non Maternity Blues group		
1 st day	0.1	0.9
2 nd day	11,4	0.01
3 rd day	6,1	0.02

Table 5. Blues Questionnaire daily score. Comparison between immigrant and Greek women in the Maternity Blues and non-Maternity Blues group. One Way Analysis of Variance with Bonferoni correction. p: level of significance

To explore further the factors that could be related to the manifestation of maternity blues in immigrant women a second stepwise logistic regression was conducted. The age, years of education, months of residence in Greece, years of marriage, social-economic status as well as the STAI, MADRS and LTE scores were entered as independent variables. The only difference between the immigrant women that developed maternity blues during the three days of observation and those that did not was the STAI state anxiety ($p: 0.001$, odds ratio: 1.2). The result indicate that immigrant women who were more anxious immediately after delivery were more likely to develop maternity blues. The significance level of the Hosmer-Lemeshow test ($p:0.5$) and the value of Nagelkerke R square (0.29) indicate that the model produced by regression analysis has goodness of fit, and it can predict around 29% of the maternity blues manifestation in immigrant women.

4.2.3 Postpartum depression

Sixty eight of the 78 (87.2%) immigrant women and 74 of the original 78 (94.9%) Greek women were reached at 1st month telephone interview. Eight (11,8%) immigrant and 10 Greek (13,5%) women had EPDS scores greater than 12. Sixty five of the 78 (83.3%) immigrant women and 68 of the 78 (87.2%) Greek women were reached at 3rd month telephone interview. Nine immigrant (11,6%) and 8 (11,6%) Greek women had EPDS scores greater than 12. Overall 11 (15,7%) of the immigrant women and 15 (20,3%) of the Greek women scored higher than 12 in the EPDS in either or both the 1st and 3rd months measurements. The comparison of the two groups did not show any statistically significant difference (table 6).

The comparison of the EPDS scores between immigrant and Greek women in the Postpartum Depression group did not show any difference. Similarly, absence of any

difference in the EPDS score between immigrant and Greek women was also observed in the non-Postpartum Depression group (table 7).

Variables	Chi Square		
	X ²	df	p
N=156			
1 st month	0.9	1	0.8
3 rd month	0.9	1	0.8
Any of the 2 interviews	0.5	1	0.5

sd: standard deviation, df: degrees of freedom, p:level of significance

Table 6. Comparison between immigrant and Greek women that developed Postpartum depressive symptomatology.

Variables	One way ANOVA	
	F	p
Postpartum Depression group		
1 st month	0.9	0.4
3 rd month	3.7	0.07
Non Postpartum Depression group		
1 st day	0.001	0.9
2 nd day	0.02	0.9

Table 7. EDPS scores. Comparison between immigrant and Greek women in the Postpartum Depression and non-Postpartum Depression group. One Way Analysis of Variance with Bonferoni correction. p: level of significance

Forward stepwise logistic regression analysis was used in order to confirm the findings for the Postpartum Depression and non Postpartum Depression groups. The EPDS score for each day together with MADRS, LTE, STAI scores, number of abortions and consultation on rearing the child (categorical variable) were entered as independent variables. For the Postpartum Depression group 3rd month score (p: 0.07, odds ratio: 1.2) was the only factor that could differentiate immigrant and Greek women. The significance level of the Hosmer-Lemeshow test (p:0.4) and the value of Nagelkerkle R square (0.32) indicate that the model produced by regression analysis has goodness of fit, and it can predict around 32% of nationality variance. For the non-Postpartum Depression group no difference was found between immigrant and Greek women.

To explore further the factors that could be related to the manifestation of Postpartum Depression symptomatology in immigrant women a second stepwise logistic regression was conducted. The age, years of education, months of residence in Greece, years of marriage, social-economic status and the manifestation of Maternity Blues as well as the STAI, MADRS, LTE scores were entered as independent variables. The only difference between the immigrant women that developed Postpartum Depressive symptomatology and those that did not was the STAI trait anxiety (p: 0.001, odds ratio: 1.1). The result indicate that immigrant women who had more anxious personality traits were more likely to develop Postpartum Depression symptomatology. The significance level of the Hosmer-Lemeshow test (p:0.2) and the value of Nagelkerkle R square (0.54) indicate that the model produced by regression analysis has goodness of fit, and it can predict around 54% of the EPDS variance.

4.3 Discussion

The two matched groups showed very few differences in the statistical analysis. The first difference concerned family planning, that is the number of abortions. Greek women have one of the highest rates of abortions in Europe and very low prevalence of contraceptive use apart from withdrawal and condoms (Ioannidi-Kapolou, 2004). The above findings could explain the differences in family planning between the two ethnic groups.

The second difference between the two groups concerned the level of support and especially the availability of consultation on issues of child rearing. Although the Albanian community is the largest immigrant community in Greece, more Albanian women replied that they did not have someone to consult or that they would not be helped during the first month of puerperium (the latter was not statistically significant).

Regarding the first aim of the study, that is to explore possible differences in the manifestation of maternity blues and postpartum depression between immigrant and mainstream culture women the results showed that very few differences existed between the two groups. A first difference was that immigrant women that did not fully develop maternity blues reported more maternity blues symptoms during the 2nd and 3rd day after delivery than Greek women. Logistic regression analysis confirmed that 2nd day symptomatology in the non Maternity Blues group was more severe in the immigrant women who also felt that they did not have adequate advice on rearing their child. The above result lead us to the conclusion that a number of immigrant women might be experiencing a more severe sub threshold type of maternity blues than Greek women. Although Kumar (1994) in his review on the relation between postnatal mental illness and transcultural factors suggested that maternity blues: "does not appear in a major way to be related to environmental, social or cultural factors", it seems, however, that some variations might exist in the expression of mild maternity blues symptomatology among women from different cultures.

A second possible difference was found in the 3rd month EPDS scores in the group of women that developed postpartum depression symptomatology. The Greek women seemed to have higher EPDS scores than the immigrant women. It should be noted that this difference did not reach statistical significance either in the ANOVA or the logistic regression analysis so it not possible to draw a definite conclusion on this result.

Contrary to the study's original hypothesis the results indicate that there are no major differences in the prevalence of postpartum depression symptomatology and maternity blues between immigrant and Greek mothers. This result is in accordance with other studies that did not find that immigration status had an impact on postpartum depression rates (Kuo et al, 2004), especially in majority immigrant groups (Mechakra-Tahiri et al, 2007; Zelkowitz et al, 2008). A possible explanation for this result is the role of social factors (Bandyopadhyay, 2010; Steward et al, 2008; Taniguchi and Baruffi, 2009) and adjustment to the mainstream culture (Gonidakis et al, 2011) in the development of depressive symptomatology. The immigrant women that participated in the study had similar socio-economical status to the Greek women, they were part of the largest immigrant group in Greece, 98.7% of them had been living in Greece more than one year, 66.7% replied that they had a steady job, and 81.3% had insurance coverage. Furthermore their country of origin, Albania, shares borders with Greece and it not uncommon for relatives to travel from

one country to the other in order to visit their kin. The study results could be used cautiously to confirm the suggestion that the impact of immigration in the development of postpartum depression is mediated through lack of support and socio-economical adversities. The comparison between immigrant and Greek women did not produce major differences in the rates of maternity blues and postnatal depression symptomatology probably because these factors did not differ greatly between the two groups.

Considering the second aim of the study, to explore possible factors that influence the manifestation of maternity blues and postpartum depression in immigrants, anxiety was the main factor that was produced from the analysis of the research data. It is interesting that according to the study's results anxiety after delivery (state anxiety) was related to the development of maternity blues while anxiety as a personality characteristic (trait anxiety) was related to the development of postpartum depression symptomatology. The relation between anxiety and depression is well established in the literature (Pollack, 2005). Specifically in the period of puerperium prenatal and antenatal anxiety has been related to the development of postpartum depression (Heron et al, 2004; Skouteris et al, 2009). Similar relation has been found between maternity blues and anxiety disorders in the puerperium (Gonidakis et al, 2007; Reck et al, 2009). It is noteworthy that contrary to various reports in the literature stressful life events during pregnancy were not related to either maternity blues or postpartum depression symptomatology (Collins et al, 2011; Gonidakis et al, 2008).

The main limitations of the study were three. Firstly the immigrant sample was restricted to one hospital and to women from Albania that had an adequate knowledge of Greek. The result of the above restriction was that the study included women who might have had a better adjustment in Greece than women who were excluded from the study and can not be generalized to the whole immigrant population. On the other hand only 9 out of 100 immigrant women were excluded from the study because of language difficulties. One explanation for the above is that immigrant Albanian women decide to have a child in Greece after a few years in the country and by that time they would have learned the language, acquired staying permission, steady employment and insurance coverage. The second limitation of the study was that the questionnaires were administered in Greek. Although all immigrant women could read Greek they still faced some difficulties understanding some of the questions. An effort was made to counteract the above difficulty with the presence of the author who could offer assistance with the scales' questions. The third limitation was that the study's design did not enable to obtain data from the fourth and fifth day of puerperium who are also crucial for the development of maternity blues (Hau and Levy, 2003; Hensaw, 2003; Rodhe et al, 1997) Thus the prevalence, time patterns and symptomatology reported in this study describe only the first three days and no conclusion can be drawn for the whole period that maternity blues last.

In conclusion the study's results indicate that there are only minor differences in the manifestation of maternity blues and postpartum depression between Albanian immigrant and Greek women. The two more interesting findings were that there might be a percentage of immigrant women that suffer from a more severe sub threshold type of maternity blues and also that anxiety seems to be the factor related with maternity blues and postpartum depression symptomatology in immigrants.

5. Conclusion

Immigrant women face a number of adversities that may compromise their mental health especially during the sensitive period after delivery. Difficulties comprehending and adapting to everyday life in a new environment, their wish to gain acceptance and safety in their host country, the lack of support and the transition from the heritage to the mainstream meaning of motherhood and finally, their struggle to “forget” traumatizing experience and make a “fresh start” in a new place are some of the issues commonly discussed by immigrant mothers. Although some of these issues may be related to the deterioration of maternal mood during the puerperium no conclusive evidence can be drawn from the available reports in the literature. Lack of support, stressful life events during pregnancy and anxiety seem to be three of the factors that are related with maternity blues and postpartum depression in immigrants. However, there is still a gap of knowledge on the interplay between culture, spirituality, acculturation and women's mood during this sensitive period. Furthermore the methodological difficulties in transcultural research hamper the expansion of our knowledge on maternity blues and postpartum depression in immigrant population.

The health worker's awareness of the relationship between immigration and mood disorders and their efforts to facilitate women's adaptation to the new situation can have a positive impact on the new mother's mental health. Of course, additional factors such as pre-immigration circumstances and the role of local ethnic communities should also be examined in order to obtain a more comprehensive view of the manifestation of postpartum depression and maternity blues in immigrant women.

6. Acknowledgments

Special thanks go to Emeritus Professor of Psychiatry A. Rabavilas, Emeritus Professor of Psychiatry G.N. Christodoulou, Professor of Gynecology G. Kreatsas and Associate Professor E. Varsou for their invaluable help in the preparation and conduct of the research that was presented in this chapter. Also to Mis E. Rogakou for her support with statistical analysis of the study's results and S. Zoakos MPhil and M. Anyfantaki MSc for proofreading the manuscript.

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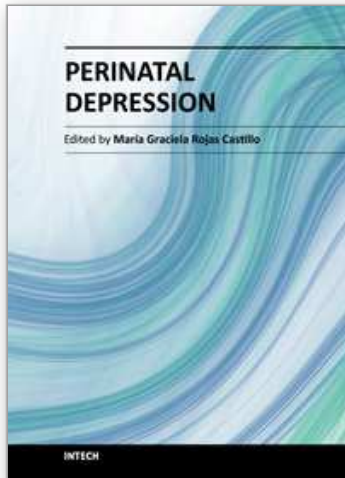
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Perinatal Depression

Edited by Dr. María Graciela Rojas Castillo

ISBN 978-953-307-826-7

Hard cover, 190 pages

Publisher InTech

Published online 20, January, 2012

Published in print edition January, 2012

This book presents ten chapters that give us important information about epidemiological, biological, clinical and psychological aspects of common mental disorders during pregnancy and in the postnatal period. Some of the issues covered in this book are: detecting postnatal depression using different instruments at the right time, which is very important to avoid the negative effects on the children of depressed mothers; understanding the impact of anxiety and depression during pregnancy and in the postnatal period; biological issues of perinatal anxiety and depression; epidemiological information about perinatal mental health problems among minorities, like immigrant population and underserved rural women. Some information is also provided on postnatal depression in men, which is frequently overlooked.

How to reference

In order to correctly reference this scholarly work, feel free to copy and paste the following:

Fragiskos Gonidakis (2012). Postpartum Depression and Maternity Blues in Immigrants, Perinatal Depression, Dr. María Graciela Rojas Castillo (Ed.), ISBN: 978-953-307-826-7, InTech, Available from: <http://www.intechopen.com/books/perinatal-depression/postpartum-depression-and-maternity-blues-in-immigrants>

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University Campus STeP Ri
Slavka Krautzeka 83/A
51000 Rijeka, Croatia
Phone: +385 (51) 770 447
Fax: +385 (51) 686 166
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InTech China

Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

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