



ORIGINAL RESEARCH ARTICLE

INCIDENCE AND PREVALENCE OF POSTPARTUM DEPRESSION IN A RURAL
COMMUNITY OF INDIA

N Shrestha ^{1*}, P Hazrah ², R Sagar ³

¹School of Public Health and Department of Community Medicine, Chitwan Medical College, Chitwan, Nepal

²Department of Surgery, Lady Hardinge Medical College, New Delhi, India

³Department of Psychiatry, AIIMS, New Delhi, India

*Correspondence to: Dr. Niki Shrestha, MD, Associate Professor, Department of Community Medicine, Chitwan Medical College, Chitwan, Nepal,

Email: drnikis1@gmail.com

ABSTRACT

Postpartum depression (PPD) is defined as presence of depressive symptoms in the postpartum period. A seemingly innocuous disorder, if untreated can lead to foeticide or maternal suicide. Unfortunately there are very few studies which have looked into the burden of the disease. The prevalence and incidence of postpartum depression vary across culture, region and communities, with very few studies having addressed the issue, thereby making it difficult to estimate the actual burden of the disease. The present study was undertaken to estimate the incidence and prevalence of postpartum depression in a rural community of India. A cohort of 200 pregnant women were interviewed in the third trimester of pregnancy and subsequently at 6 weeks postpartum to screen for presence and severity of depressive symptoms using BDI, ICD10 and EPDS scores. A cutoff score > 13 was considered as positive for depression in EPDS. The prevalence of PPD was 12% and incidence of PPD 4.4%.

Key words: BDI, EPDS, Foeticide, Maternal suicide, Postnatal depression, Postpartum depression

DOI: <http://dx.doi.org/10.3126/jcmc.v5i2.13149>

INTRODUCTION

Life with the new born can be very thrilling and rewarding but at the same time, it can be very hard and strenuous for some. This beautiful moment of having a new born brings about many physical, hormonal and emotional changes in the women during childbirth. These changes, collectively with other compounding factors, may lead to a feeling of sadness, anxiety, scare and confusion among many mothers. Such feelings make it extremely difficult for the mother to take care of herself or to tend to the needs of the new born. This in turn puts a lot of strain on the family relationships. For most mothers these feelings are temporary and disappear as quickly as they appear but for some unfortunate mothers, it not only remains but develops into a serious yet common disorder known as postpartum depression (PPD).

PPD is characterized by depressive symptoms and a diagnosis of depression that occur several weeks after childbirth. ¹ The signs and symptoms of PPD are

generally indistinguishable from major depressive disorder that occurs at other times than postpartum period. ¹ But negative or ambivalent feelings toward the child or doubts about the motherhood quality are generally reported by women with PPD. ² Although it had been long thought that the problems associated with childbirth were a normal part of being a new mother, recent studies have indicated that postpartum depression is a serious disorder if unrecognized and left untreated³ can develop into a more severe condition called postpartum psychosis, which may eventually lead to suicide and/or infanticide. ⁴ Many mothers choose to live with postpartum depression rather than get help because of their inability to recognize it as a depressive disorder or due to their ignorance and lack of provision of relevant health education that should be imparted to them during their pregnancy.

The reported rate of PPD varies according to

study design, diagnostic criteria, race, culture, and country. In the developed nations where the infant and maternal mortality rates are low, more emphasis is being placed on postpartum depression and thus is being highlighted and recognized as a disorder of significant public health concern. However, in most developing nations, the problem of postpartum depression is often over looked which probably explain as to why there has been a paucity of research on postpartum depression in developing countries.

This study was therefore undertaken to find out the prevalence and incidence of post partum depression in a rural community of India.

MATERIAL AND METHODS

A prospective observational cohort study was undertaken in the period between July 2003 to June 2005 at Chhainsa, a village under the Intensive Field Practice Area of the Comprehensive Rural Health Services Project (CRHSP), Ballabgarh Center for Community Medicine, All India Institute of Medical Sciences, New Delhi.

At the time of the study, the village had 800 households with an approximate population of 8000. A total of 200 women were recruited in their third trimester of pregnancy. The list of eligible women was obtained from the computerized data base in Comprehensive Rural Health Services Project (CRHSP), Ballabgarh. The computerized Management Information System in Ballabgarh is updated every month. In order to ensure a complete enrollment of all the eligible women, the key persons like the Health Workers, Dais, and the Aanganwadi workers were also asked to inform of pregnancies and deliveries in the village. All women present in the last trimester of pregnancy and 6 weeks postpartum were included in the study. Women not willing to participate in the study and women not available at the home for two visits in spite of prior notice were excluded from the study. Three home visits were made. A preliminary visit was made to these women, primarily to establish a rapport. The demographic and baseline data was also collected during this visit. The second visit was made when the women were in their third trimester (29-40 weeks) of pregnancy. The interview session in this visit had 3 components – a) Administering of the structured interview schedule to the study subjects; b) Administering of the Beck Depression Inventory (BDI) scale – Hindi version to the study subjects; c)

Application of the ICD-10 criteria on the subjects who had BDI scores suggestive of depression.

The interview session in the 3rd visit was conducted at 6 weeks postpartum and had 4 components a) Administering of the structured interview schedule to the study subjects; b) Administering of the BDI scale- Hindi version to the study subjects; c) Application of the ICD-10 criteria on the subjects who had BDI scores suggestive of depression and d) administering of the Edinburgh Postnatal Depression Scale (EPDS)-Hindi version on the subjects. A cutoff limit of >13 was taken for a positive diagnosis of depression in EPDS.

After the completion of the interview, those women who were found to be depressed were followed up in the psychiatry OPD at CRHSP, Ballabgarh.

Ethics: Our study was only an observational study and informed consent was obtained from participants prior to the study and ethical clearance was obtained from the Institutional Ethics Review Committee of AIIMS.

Statistics: A computerized data base was created using SPSS software and statistical tests done.

RESULTS

A total of 200 patients were recruited for the study. The demographic, socio-economic and obstetric characteristics have been tabulated in Table 1. The mean age of the study participants was 22.6 years. Majority (61.5%) were in the age group 20-25 years. The mean age of marriage was 17.5 years. Majority (47.5%) belonged to the middle class category and 12.5% of the participants belonged to the low class category. Only 9.5% of the women belonged to the upper middle class category. Of the 200 women recruited, 49.5% of them were illiterate and 50.5% had studied to some level (primary-18.5%, secondary-24.5%, and higher secondary and above-7.5%). Only 2 women were graduates (included in higher secondary and above). Only 18% of the husbands of the participants were illiterate, 82% had some level of education with 10 of them being graduates (included in higher secondary and above). Most of the participants, 81.0%, were living in joint families, 31.5% were primigravida, 69% were gravida 2 or more, 38.5% were nulliparous.

Prevalence of antepartum depression at the time of

enrolment: Antepartum screening using Beck Depression Inventory was positive for depression in 20 women (10%), On further administration of ICD-10 criteria to the enrolled members (n=200) it was found that the same 20 women (10%) suffered from depression of which 14 (70.0%) were mildly depressed and 6 (30.0%) were moderately depressed. Using BDI scale and confirmed by ICD-10, twenty subjects (20/200) were positive giving a prevalence rate of 10% with 95% CI (0.058-0.142). (Table 2)

Table 1: Demographic, Socioeconomic and Obstetric Characteristics Of The Study Population

| Characteristics | Category | Number (n = 200) | Percentage |
|---|---------------------------|------------------|------------|
| Age in years | < 20 | 38 | 19.0 |
| | 20-25 | 123 | 61.5 |
| | > 25 | 39 | 19.5 |
| Age at Marriage in years | < =18 | 95 | 47.5 |
| | > 18 | 105 | 52.5 |
| Socioeconomic status* | Lower class | 25 | 12.5 |
| | Lower middle class | 61 | 30.5 |
| | Middle class | 95 | 47.5 |
| | Upper middle class | 19 | 9.5 |
| Education of participants | Illiterate | 99 | 49.5 |
| | Up to Primary | 37 | 18.5 |
| | Secondary | 49 | 24.5 |
| | Higher secondary or above | 15 | 7.5 |
| Education of husband of study participant | Illiterate | 36 | 18.0 |
| | Up to Primary | 20 | 10.0 |
| | Secondary | 96 | 48.0 |
| | Higher secondary or above | 48 | 24.0 |
| Family type | Joint family | 162 | 81.0 |
| | Nuclear family | 38 | 19.0 |
| Gravida | Gravida 1 | 63 | 31.5 |
| | Gravida 2 to 4 | 108 | 54.0 |
| | Gravida 5 or more | 29 | 14.5 |
| Parity | Para 0 | 77 | 38.5 |
| | Para 1 to 2 | 82 | 41.0 |
| | Para 3 or more | 41 | 20.5 |

Prevalence of post partum depression at 6 weeks post delivery: On screening with BDI Scale post delivery, 24 (12%) women were positive for depression which was confirmed by ICD10. Of these 24 respondents, sixteen were also depressed during the antenatal period at enrolment, but 4 who were depressed during the ante natal period were negative for depression at the end of the postpartum period. When EPDS was used, the same 24 were also found to be positive. Using BDI scale and confirmed by ICD-10, twenty four (24) were positive giving a rate of 12% with 95% CI (0.075 – 0.165), (Table 2).

Table 2 : Prevalence, Incidence And Severity Of Depression In The Study Population In Antenatal And Postpartum Period As Assessed By BDI, ICD 10 and EPDS Scores

| Variable (Measurement Scale) | Number n= 200 | % |
|--|------------------|------|
| Antenatal Depression (BDI) | | |
| Present | 20 | 10 |
| Not present | 180 | 90 |
| Antenatal Depression (ICD10) | | |
| No Depression | 180 | 90 |
| Mild Depression | 14 | 7 |
| Moderate Depression | 6 | 3 |
| Postpartum Depression (BDI) | | |
| Present | 24 | 12 |
| Not Present | 176 | 88 |
| Postpartum Depression (ICD10) | | |
| No Depression | 176 | 88 |
| Mild Depression | 10 | 5 |
| Moderate Depression | 14 | 7 |
| Postpartum Depression (EPDS) | | |
| Low probability | 176 | 88.0 |
| High probability | 24 | 12.0 |
| New diagnosed cases of depression only in postpartum i.e. excluding cases with antenatal depression (BDI) | | |
| Present | 8 | 4.4 |
| Not Present | 172 | 95.6 |

Incidence of depression during postpartum period: Number of women who did not have depression before delivery were 180. Twenty four were positive for depression at the end of postpartum (6 weeks). However, out of this, 16 were positive before delivery. Thus, those who developed depression during postpartum were 8, giving an incidence rate of 4.4% with 95% CI (0.014-0.074) (Table 2)

Table 3: Prevalence And Incidence Of Postpartum Depression In Literature Studies 2004-2014.

| Author | Place | SS | Scale used | Prevalence % | Incidence % |
|----------------------------|-------------|------|-------------------------|--|-------------|
| Deng AW et al, 2014 | China | 1823 | EPDS | 27.37% | |
| Al Hinai FI et al, 2014 | Oman | 282 | EPDS | 13.5% at 2 wks, 10.6% at 8 wks | |
| Pocan AG et al, 2013 | Turkey | 187 | EPDS | | 28.9% |
| Panyayong B et al, 2013 | Thailand | 1731 | EPDS | 8.4% | |
| Motzfeldt I et al, 2013 | Greenland | 174 | EPDS | 8.6% | |
| Burgut FT et al, 2013 | Qatar | 1379 | EPDS | 17.6% | |
| Lucero NB et al, 2012 | Hispanic | 96 | BDI, PDSS | 54.2% | |
| Al Dallal FH et al. 2012 | Bahrain | 237 | EPDS | 37.1% | |
| Dubey C et al, 2012 | New Delhi | 506 | EPDS | 6% | |
| Lanes A et al, 2011 | Canada | 6421 | EPDS | Minor & major 8.46% & 8.69% respectively | |
| Glasser S et al, 2011 | Israel | 104 | EPDS | 43% at cut off score 10 and 26% | |
| Mohammad KI et al, 2011 | Jordan | 353 | EPDS & others | APD 19% PPD was 22% | |
| Nagy E et al, 2011 | Hungary | 1030 | EPDS and BDI | 10.81% | |
| Ozbaşaran F et al, 2011 | Turkey | ?? | EPDS | 28.3% | |
| Savarimuthu RJ et al, 2010 | South India | 137 | EPDS, ICD 10 | 26.3% | |
| Piacentini Det al, 2009 | Bergamo | 595 | EPDS | 7.1% | |
| Glavin K et al, 2009 | Norway | 2227 | EPDS | 10.1% | |
| Grussu P et al, 2009 | Italy | 297 | EPDS | 13% | |
| Póo F AM et al, 2008 | Chile | 73 | EPDS | 50.7% | |
| Ebeigbe PNet al, 2008 | Nigeria | 206 | EPDS | | 27.2% |
| Tannous L et al, 2008 | Brazil | 271 | EPDS | 20.7% | |
| Dietz PM et al, 2007 | USA | 4398 | | 8.7% before pregnancy, 6.9% APD, 10.4% PPD | |
| Ayvaz S et al, 2006 | Turkey | 316 | BDI, EPDS & other scale | 28.1% | |
| Nakku JE et al, 2006 | Uganda | 544 | SRQ-25 and MINI | 6.1% | |
| Gulseren L et al, 2006 | Turkey | 125 | EPDS | 21.6% in pregnancy , 16.8%, 14.4% & 9.6% PPD | |
| Moraes IG et al, 2006 | Brazil | 410 | Hamilton scale | 19.1% | |
| Limlomwongse N et al. 2006 | Thailand | 610 | EPDS | 20.5% AP, 16.8% PP | |
| Baker L et al, 2005 | USA | 151 | PDSS | | 23% |
| Agoub M et al, 2005 | Morocco | 144 | EPDS and MINI | 6.9%, 11.8% and 5.6% 6 wks, 6 & 9 months | |
| Fisher JR et al, 2004 | Vietnam | 506 | EPDS | 33% | |
| Ekuklu G et al, 2004 | Turkey | 210 | EPDS | 40.4% | |

*APD = Antepartum Depression, ** PPD = Postpartum Depression, # PP = Postpartum

DISCUSSION

Postpartum depression has not been extensively reviewed in literature. In our review of articles published in Pubmed in the past 10 years (2004-2014), we have identified 31 such studies.^{1, 5-34} (Table 3). Though community based prospective longitudinal studies are ideal for finding the actual incidence and prevalence of PPD, more so in developing countries where all pregnant patients do not necessarily acclaim a hospital service and methods of data documentation and reporting are not stringent, a number of these studies reviewed were essentially hospital/ clinic based.^{1,6,8, 12,15,19,20,23,33}

Most authors have resorted to a single cross sectional survey in the postpartum period.^{1,5-11,14,16-24,26, 27,29,32-34} The essential flaw in a single time point evaluation in the postpartum period is over estimating the prevalence as it undermines the importance of, exclusion of cases that may have also pre existing depression in the antepartum period which does not necessarily classify as postpartum depression. Therefore the incidence of the disease is probably a more important estimate than point prevalence as was estimated in most studies. Occasionally retrospective studies have also been published by extracting data from national databases or baby clinics.^{13,21,35} The inherent fallacy of such studies is exclusion of cases with still births and intrauterine deaths as also the limitation imposed due to sampling errors. Our study differs from others in that a two time point assessment was carried out in a community cohort and a meticulous follow up was ensured to avoid attrition related errors. Thus patients with pre existing antepartum depression could be excluded and an accurate incidence and prevalence could be calculated.

Whereas the definition of the period of postpartum depression applies largely to a duration of 6 weeks in the postpartum period,³⁶ and most authors have assessed the prevalence of PPD at around 6-8 weeks postpartum,^{1,11,20,21,23-24,26,27,33,34} nevertheless a variable time period has been included and in some studies upto 6 -9 months postpartum period has been included,^{9,15,32} Some authors have assessed prevalence of a cumulative antepartum and postpartum or peripartum depression.^{12,35} In an interesting study conducted in Turkey, prevalence of depression was assessed at 36-38 weeks antepartum and then again at 5-8, 10-14 and 20-26 weeks postpartum. The authors noted

a gradual decline in prevalence of depression which was reported to be highest in pregnancy (21.6%) and declined gradually in the follow-up period (respectively, 16.8%, 14.4% and 9.6%) (28) thereby emphasizing the need to apply the tests at a particular time period after delivery to ensure comparability amongst studies. It also emphasizes that PPD might be overestimated if measured in early postpartum period as an appreciable fraction of such patients perhaps undergo spontaneous recovery.

The EPDS SCALE has been used for assessment of postpartum depression in majority of the studies. In some of the studies, only EPDS has been used,^{1, 5-9, 11-14,17,19,20,22-24,28,33,34} whereas in other studies, EPDS in combination with ICD 10, BDI and other scales have been used.^{15,16,18,21, 26,32} Scales such as PDSS, MINI, Hamilton depression scale and SRQ25 have been used rarely.^{10,27,29,31} The major drawback of the EPDS scale is its inability to assess antepartum depression as it is specifically designed for postpartum depression. Thus we have also used in addition to EPDS, the Beck the Becks Depression Inventory which could be used in both the antepartum and postpartum period and thus help in assessment of true incidence and prevalence of postpartum depression as has been used by other authors.^{16,26} The reported sensitivity and specificity of EPDS is 76% (95% confidence interval (CI)=60.5-87.1) and 92% (95% CI=90.5-94.1) respectively.¹⁶ In our study the results of assessment with EPDS and BDI were corroborative. Whereas assessment of presence or absence of depression can be evaluated with the above scales, evaluating the severity of depression is also important. Thus we have used the ICD 10 criteria as well. ICD 10 criteria is the standardized confirmative test for diagnosing depression. The ICD 10 criteria further confirmed our observations using the BDI scale. Another issue of contention is the cutoff limit administered for diagnosing depression using EPDS. Some authors have used a cutoff limit as low as 8 points²¹ whereas others have used higher scores i.e. upto 13.^{8,16,17,24} The generally recommended cutoff limits for EPDS is >13 for possibility of depression and > 15 for high probability of depression. In an interesting study it was noted that changing the cutoff limit of EPDS from 10 to 13 resulted in an approximately 50% decrease in prevalence of PPD (14). We have used a cutoff limit of > 13.

The prevalence of post partum depression was

12% in this study. A varied prevalence of PPD is noted amongst different countries, cultures, races and climatic zones. Till date there were two other studies from the Indian subcontinent. A study from rural south India noticed prevalence of 26.3% in 137 women using both EPDS and ICD 10 (18) whereas a study from a tertiary based hospital in north India in a region close to our present study quotes a 6 % prevalence in 506 peripartum women using EPDS with cutoff limit of ≥ 10 .¹² Table 3 shows the incidence and prevalence of PPD in various studies in literature since 2004. The sample size in these studies have varied from 96 (10) to 6421.¹³ However, our study being time bound, we had a sample size of 200. Given the heterogeneity of the data with respect to scales used, the cutoff limits defined and the time of assessment in the postpartum period as also absence of data on antepartum depression in most studies a meaningful comparison is hampered.

Only a few studies have estimated the incidence of PPD. The incidence of PPD in this study was 4.4%. This finding is much lower than an incidence of 28.9% in a study conducted in 187 women in Turkey as assessed using the EPDS.¹ A hospital based study conducted in Nigeria among 206 women using the EPDS reported an incidence of 27.2%.²³ In Trabzon Province the incidence of depression among 316 subjects using BDI and EPDS was 28.1%.²⁶ Another study conducted in a native American population of 151 women, the incidence of PPD was reported to be 23%.³¹ Prospective studies in Australia, England, Hong Kong, Sweden, and the United States on the incidence of PPD 4-8 weeks after birth reports an incidence varying from 9%-27.5%.³⁷⁻³⁹ A difference has been noted with respect to postpartum depression in women of developing 7%-15% and developed countries⁴⁰ and in 19%-25% of women in developing countries (29,41) Moreover, > 50% of women with PPD are reported to have depression before or during pregnancy.²⁵ The reasons for a lower incidence of PPD in the present study are only speculative and can be addressed in further trials

The major limitation of the trial is the small sample size and restriction to a single community cohort hindering extrapolation into the general population. Larger community based studies on PPD are thus warranted. Also a stringent definition of the time period of evaluation, as also that of measurement scales and cutoff limits remains to be addressed

before any recommendation can be made for routine screening for PPD.

Acknowledgements: I express my heartfelt thanks to my guide Late Professor Dr Bir Singh from AIIMS and to my co-guide Late Professor Dr V.P. Reddaiah from AIIMS for their guidance.

Conflict of Interest: No Financial or non financial conflict of interest

REFERENCES

- Poçan AG, Aki OE, Parlakgümüs AH, Gereklıoğlu C, Dolgun AB. The incidence of and risk factors for postpartum depression at an urban maternity clinic in Turkey. *Int J Psychiatry Med.* 2013;46(2):179-94.
- Sadock BJ, Sadock VA, editors. Kaplan and Sadock's comprehensive textbook of psychiatry (7th Edition). Philadelphia, PA: 2000.
- C. Neill Epperson. Postpartum Major Depression: Detection and Treatment. *Am Fam Physician.* 1999 Apr 15;59(8):2247-2254.
- Yip SK, Chung TK, Lee TS. Suicide and maternal mortality in Hong Kong. *Lancet.* 1997; 350:1103.
- Deng AW, Xiong RB, Jiang TT, Luo YP, Chen WZ. Prevalence and risk factors of postpartum depression in a population-based sample of women in Tangxia Community, Guangzhou. *Asian Pac J Trop Med.* 2014 Mar;7(3):244-9.
- Al Hinai FI, Al Hinai SS. Prospective study on prevalence and risk factors of postpartum depression in Al-dakhliya governorate in Oman. *Oman Med J.* 2014 May;29(3):198-202.
- Panyayong B. Postpartum depression among Thai women: a national survey. *J Med Assoc Thai.* 2013 Jul;96(7):761-7.
- Motzfeldt I, Andreasen S, Pedersen AL, Pedersen ML. Prevalence of postpartum depression in Nuuk, Greenland--a cross-sectional study using Edinburgh Postnatal

- Depression Scale. *Int J Circumpolar Health*. 2013 Aug 5;72.
9. Burgut FT, Bener A, Ghuloum S, Sheikh J. A study of postpartum depression and maternal risk factors in Qatar. *J Psychosom Obstet Gynaecol*. 2013 Jun;34(2):90-7.
 10. Lucero NB, Beckstrand RL, Callister LC, Sanchez Birkhead AC. Prevalence of postpartum depression among Hispanic immigrant women. *J Am Acad Nurse Pract*. 2012 Dec;24(12):726-34.
 11. Al Dallal FH, Grant IN. Postnatal depression among Bahraini women: prevalence of symptoms and psychosocial risk factors. *East Mediterr Health J*. 2012 May;18(5):439-45.
 12. Dubey C, Gupta N, Bhasin S, Muthal RA, Arora R. Prevalence and associated risk factors for postpartum depression in women attending a tertiary hospital, Delhi, India. *Int J Soc Psychiatry*. 2012 Nov;58(6):577-80.
 13. Lanes A, Kuk JL, Tamim H. Prevalence and characteristics of postpartum depression symptomatology among Canadian women: a cross-sectional study. *BMC Public Health*. 2011 May 11;11:302.
 14. Glasser S, Stoski E, Kneller V, Magnezi R. Postpartum depression among Israeli Bedouin women. *Arch Womens Ment Health*. 2011 Jun;14(3):203-8.
 15. Mohammad KI, Gamble J, Creedy DK. Prevalence and factors associated with the development of antenatal and postnatal depression among Jordanian women. *Midwifery*. 2011 Dec; 27(6):e238-45.
 16. Nagy E, Molnar P, Pal A, Orvos H. Prevalence rates and socioeconomic characteristics of post-partum depression in Hungary. *Psychiatry Res*. 2011 Jan 30;185(1-2):113-20.
 17. Ozbaşaran F, Coban A, Kucuk M. Prevalence and risk factors concerning postpartum depression among women within early postnatal periods in Turkey. *Arch Gynecol Obstet*. 2011 Mar; 283(3):483-90.
 18. Savarimuthu RJ, Ezhilarasu P, Charles H, Antonisamy B, Kurian S, Jacob KS. Postpartum depression in the community: a qualitative study from rural South India. *Int J Soc Psychiatry*. 2010 Jan;56(1):94-102.
 19. Piacentini D, Leveni D, Primerano G, Cattaneo M, Volpi L, Biffi G, Mirabella F. Prevalence and risk factors of postnatal depression among women attending antenatal courses. *Epidemiol Psichiatri Soc*. 2009 Jul-Sep;18(3):214-20.
 20. Glavin K, Smith L, Sørnum R. Prevalence of postpartum depression in two municipalities in Norway. *Scand J Caring Sci*. 2009 Dec;23(4):705-10.
 21. Grusso P, Quatraro RM. Prevalence and risk factors for a high level of postnatal depression symptomatology in Italian women: a sample drawn from ante-natal classes. *Eur Psychiatry*. 2009 Jun; 24(5):327-33.
 22. Póo F AM, Espejo S C, Godoy P C, Gualda de la C M, Hernández O T, Pérez H C. Prevalence and risk factors associated with postpartum depression in puerperal women consulting in primary care. *Rev Med Chil*. 2008 Jan;136(1):44-52.
 23. Ebeigbe PN, Akhigbe KO. Incidence and associated risk factors of postpartum depression in a tertiary hospital in Nigeria. *Niger Postgrad Med J*. 2008 Mar;15(1):15-8.
 24. Tannous L, Gigante LP, Fuchs SC, Busnello ED. Postnatal depression in Southern Brazil: prevalence and its demographic and socioeconomic determinants. *BMC Psychiatry*. 2008 Jan 3; 8:1.
 25. Dietz PM, Williams SB, Callaghan WM, Bachman DJ, Whitlock EP, Hornbrook MC. Clinically identified maternal depression before, during, and after pregnancies ending in live births. *American Journal of Psychiatry* 2007;164(10):1515-1520.
 26. Ayvaz S, Hocaoglu C, Tiryaki A, Ak I. Incidence of postpartum depression in Trabzon province and risk factors at gestation. *Turk Psikiyatri Derg*. 2006 Winter;

- 17(4):243-51.
27. Nakku JE, Nakasi G, Mirembe F. Postpartum major depression at six weeks in primary health care: prevalence and associated factors. *Afr Health Sci.* 2006 Dec;6(4):207-14.
 28. Gulseren L, Erol A, Gulseren S, Kuey L, Kilic B, Ergor G. From antepartum to postpartum: a prospective study on the prevalence of peripartum depression in a semiurban Turkish community. *J Reprod Med.* 2006 Dec;51(12):955-60.
 29. Moraes IG, Pinheiro RT, Silva RA, Horta BL, Sousa PL, Faria AD. Prevalence of postpartum depression and associated factors. *Rev Saude Publica.* 2006 Feb;40(1):65-70.
 30. Limlomwongse N, Liabsuetrakul T. Cohort study of depressive moods in Thai women during late pregnancy and 6-8 weeks of postpartum using the Edinburgh Postnatal Depression Scale (EPDS). *Archives of Women's Mental Health* 2006;9(3):131-138.
 31. Baker L, Cross S, Greaver L, Wei G, Lewis R; Healthy Start CORPS. Prevalence of postpartum depression in a native American population. *Matern Child Health J.* 2005 Mar; 9(1):21-5.
 32. Agoub M, Moussaoui D, Battas O. Prevalence of postpartum depression in a Moroccan sample. *Arch Womens Ment Health.* 2005 May;8(1):37-43.
 33. Fisher JR, Morrow MM, Ngoc NT, Anh LT. Prevalence, nature, severity and correlates of postpartum depressive symptoms in Vietnam. *BJOG.* 2004 Dec; 111(12):1353-60.
 34. Ekuklu G, Tokuc B, Eskiocak M, Berberoglu U, Saltik A. Prevalence of postpartum depression in Edirne, Turkey, and related factors. *J Reprod Med.* 2004 Nov; 49(11):908-14.
 35. Le Strat Y1, Dubertret C, Le Foll B. Prevalence and correlates of major depressive episode in pregnant and postpartum women in the United States. *J Affect Disord.* 2011 Dec;135(1-3):128-38.
 36. Stewart, D.E., Robertson, E., Dennis, C-L., Grace, S.L., & Wallington, T. (2003). Postpartum depression: Literature review of risk factors and interventions.
 37. Ballard CG, Davis R, Cullen PC, Mohan RN, Dean C. Prevalence of postnatal psychiatric morbidity in mothers and fathers. *British Journal of Psychiatry* 1994;164(6):782-788.
 38. Stamp GE, Crowther CA. Postnatal depression: A South Australian prospective survey. *Australia and New Zealand Journal of Obstetrics and Gynaecology* 1994;34(2):164-167.
 39. Josefsson A, Berg G, Nordin C, Sydsjö G. Prevalence of depressive symptoms in late pregnancy and postpartum. *Acta Obstetrics and Gynecology Scandinavica* 2001; 80(3):251-255.
 40. O'Keane V, Marsh MS. Depression during pregnancy. *British Medical Journal* 2007; 334(7601):1003-1005.
 41. Lee DT, Yip SK, Chiu HF, Leung TY, Chan KP, Chau IO, Leung HC, Chung TK. Detecting postnatal depression in Chinese women. Validation of the Chinese version of the Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 1998; 172:433-437.