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**Original Research Article**

# A study on prevalence of postpartum depression: a cross-sectional study using Edinburgh postnatal depression scale

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## ABSTRACT

**Background:** Postpartum depression (PPD) is defined as a non-psychotic depressive episode that starts in the postpartum period, generally defined as the year after delivery. It has been suggested that about 50-80% of women suffer from baby blues after birth. The present study was conducted to determine the prevalence of postpartum depression using the Edinburgh postnatal depression scale.
**Methods:** The study area chosen was the field practice area of urban health centre attached to department of community medicine, S. N. Medical College, Bagalkot, Karnataka. It was a cross-sectional study done during the period of January and June 2023. A predesigned proforma was used for obtaining the data. Data was entered in excel sheet and analysed using spss software.
**Results:** Among the 165 mothers who were willing to participate in the study, 33 mothers i.e., 20% of them were at a major risk of developing post-partum depression. Our study showed significant association with poor socioeconomic status, complication during labour, mode of delivery, gender of the baby. The association between the gender of the baby and postpartum depression was statistically significant.
**Conclusions:** Postpartum depression, as evident from the study, is a major public health problem which usually goes missed during the evaluation of mother and child's health during mothers' reproductive period. Hence women should be screened for potential risk factors and depressive symptoms during pregnancy and postpartum periods so that appropriate interventions, if needed, can be initiated in a timely fashion.

**Keywords:** Edinburgh postnatal depression scale, Postpartum depression

## INTRODUCTION

Pregnancy, delivery and adaptability with new born babies are the most sensitive phases in women's life.[1] During this period of time, women usually suffer from physiological, spiritual, and psychological crisis. The first six weeks after delivery is a vulnerable period for postpartum depression (PPD).[2] Of 4 million births that occur in the world annually, approximately 40% of new mothers are affected with different types of postpartum mood disorders including depression symptoms before, during and after pregnancy.[3] The global prevalence of PPD has been estimated to be between 10-25%.[4-9] It is the most common complication of childbirth.[5] Prevalence of PPD is closely linked with socioeconomic and cultural factors and it varies among different countries, ethnicities and races.[6]

PPD is defined as a non-psychotic depressive episode that starts in the postpartum period, generally defined as the year after delivery.[10] Postpartum depression encompasses disorders ranging in severity from baby blues to postpartum psychosis [10] with onset of episodes within 4-6 weeks after birth.[11] It has been suggested that about 50-80% of women suffer from baby blues after birth, but estimates of the prevalence of postpartum depressive disorders vary substantially depending on the assessment and timing of screening, sample size and population characteristics.[10]

The PPD can be serious for the mother, her new born, and the entire family. Depressed mothers may experience unnecessary suffering, deteriorating health status, reduced breast feeding, marital discord, and suicidal ideation.[11-13] Offspring of these depressed mothers have been shown to have significant emotional, cognitive, and developmental delays, as well as an increased risk for mental disorders, which can persist throughout childhood.[14-16] In consideration of these and other findings, PPD has been called "the most significant obstetrical complication after delivery" and the illness was recently elevated to a "global health challenge" by the World Health Organization and the March of Dimes.[17]

While screening is important, there are significant barriers that prevent the majority of pregnant and postpartum women from seeking mental healthcare and disclosing concerns. These include the stigma of mental health, lack of understanding of whether symptoms are abnormal or a typical pregnancy experience, having providers or support persons underestimate their symptoms and concerns, and fear that reporting symptoms will lead others to think that they will be an incompetent mother, prevent the majority of pregnant and postpartum women from seeking mental healthcare and disclosing concerns.[18-22] Risk factors for postpartum depression were clustered into five major groups: biological/physical (e.g., riboflavin consumption), psychological (e.g., antenatal depression, previous PPD, alcohol, drug abuse), obstetric/paediatric (e.g., unwanted pregnancy, low birth baby), socio-demographic (e.g., poverty), and cultural factors (e.g., preference of infants' gender, refugees, asylum, immigrants). Traditional postpartum rituals were not found to provide substantial psychological benefits for the new mothers.[12-19,23]

However, in spite of increasing evidence that postpartum depression can be effectively treated and possibly prevented, it often goes undetected and untreated in many women. Hence the study of prevalence of postpartum depression in women acquires a prime importance.

The depressive symptoms of mother in this study are identified by screening, using Edinburgh postnatal depression scale (EPDS). It is a valuable and efficient way of identifying mother at risk for PPD. Hence this study was taken up with following objectives:

To estimate the prevalence of postpartum depression using EPDS scale. To study the association between the Postpartum depression and postpartum associated risk factors.

## METHODS

This study was conducted in the field practice area of urban health centre attached to department of community medicine, S. N. Medical College, Bagalkot, Karnataka. Institutional ethical clearance was obtained before collecting the data.

### *Study design*

It was a cross-sectional study.

### *Study population*

The urban health centre serves a total population of 17624 (January 2023 data). All postnatal mothers in puerperium (42 days of delivery) were included in the study.

### *Study period*

The study took place from January to June 2023.

### *Sample size*

Sample size calculation was done using OpenEPiSoft ware, Version 2.3.1.

**Table 1: Sample size calculation.**

| **Sample size for frequency in a population** | |
|---|---|
| **Population size (for finite population correction factor or FPC) (N):** | 1000000 |
| **Hypothesized % frequency of outcome factor in the population (p)(4):** | 12±5% |
| **Confidence limits as % of 100 (absolute ±%) (d):** | 5% |
| **Design effect (for cluster surveys-DEFF):** | 1 |
| **Sample size (n)** | |
| **Confidence levels (%)** | **Sample size** |
| **95%** | 163 |
| **Equation** | |
| **Sample size n = [DEFF*Np(1-p)]/[($d^2/Z^2_{1-\alpha/2}$*(N-1) + p*(1-p)]** | |

Hence the sample size for the study was 165.

### *Inclusion criteria*

All postnatal mothers in puerperium within 28-42 days were included in the study. Those who gave consent and agreed to participate in this study.

***Exclusion criteria***

Those who have not given consent for the study. Those who were diagnosed and treated for depression and other psychiatric disorders before this pregnancy. Those who had still births/neonatal deaths in this study.

***Study instrument***

The EPDS scale consists of 10 items; each item is scored with 0-3 points. The total score ranges from 0-30 points. Mothers who score less than 10 were considered as normal. Mothers who scored more than 11 were considered as postpartum depression. A threshold value of 10 gave a sensitivity of 100% and a specificity of 87%, resulting in many false positives. A threshold value of 11 or more gave a higher specificity (92%), but also a significantly lower sensitivity (67%) and thus a risk of ignoring women with depression problems.[24] Therefore score above 11 was considered to be of possible depression in the present study.

***Data collection***

Ethical clearance was obtained from institutional ethical committee. After obtaining informed consent from the postnatal mothers, basic socio-demographic profile of the postnatal mothers was obtained using predesigned proforma. The study was conducted at their residence. Mothers were approached during 4-6 weeks of their postnatal period. EDPS scale questionnaire was applied in their regional language and filled by the investigator. Post natal mothers who were having possible PPD, were encouraged to consult a psychiatrist for the management.

***Statistical analysis***

Data collected was tabulated in the Microsoft excel sheet and analysed using SPSS software. Chi-square for proportions and 't' test for the quantitative data were used.

## RESULTS

In the present study 165 postpartum mothers participated. Maximum of study subjects were between 18-28 years (90.3%). Maximum of study subjects were house wives (81.8%). Maximum of study subjects were from class IV and V (69.7%) (Table 2). The prevalence of postpartum depression was found to be 20% in the study subjects (Table 5). The association between the birth weight of the baby and postpartum depression was not statistically significant. The association between the duration of the marriage and postpartum depression was not statistically significant (Tables 3 and 4). The association between the postnatal days and postpartum depression was not statistically significant. Postpartum depression was common in class IV and V (66.6%). The association between the socioeconomic status and postpartum depression was statistically significant.

**Table 2: Demographic profile of study participants.**

| Age in years | N | % |
|---|---|---|
| ≤18 | 2 | 1.2 |
| 19-23 | 83 | 50.3 |
| 24-28 | 66 | 40.0 |
| 29-33 | 12 | 7.3 |
| 34+ | 2 | 1.2 |
| **Wife occupation** | | |
| Professional | 3 | 1.8 |
| Semi-professional | 1 | .6 |
| Skilled | 3 | 1.8 |
| Semiskilled | 3 | 1.8 |
| Unskilled | 20 | 12.1 |
| House wife | 135 | 81.8 |
| **Husbands' occupation** | | |
| Professional | 12 | 7.3 |
| Semi-professional | 7 | 4.2 |
| Skilled | 30 | 18.2 |
| Semiskilled | 56 | 33.9 |
| Unskilled | 60 | 36.4 |
| **Socio-economic status (According to Modified B. G. Prasad classification** | | |
| I | 3 | 1.8 |
| II | 16 | 9.7 |
| III | 31 | 18.8 |
| IV | 66 | 40.0 |
| V | 49 | 29.7 |

**Table 3: The distribution of study subjects according to obstetric score.**

| Parity | N | Percentage |
|---|---|---|
| 1 | 66 | 40.0 |
| 2 | 68 | 41.2 |
| 3 | 21 | 12.7 |
| 4 | 7 | 4.2 |
| 5 | 2 | 1.2 |
| 7 | 1 | 0.6 |
| **Number of living children** | | |
| 0 | 1 | 0.6 |
| 1 | 67 | 40.6 |
| 2 | 68 | 41.2 |
| 3 | 20 | 12.1 |
| 4 | 6 | 3.6 |
| 5 | 2 | 1.2 |
| 6 | 1 | 0.6 |
| **Previous abortions** | | |
| 0 | 153 | 92.7 |
| 1 | 9 | 5.5 |
| 2 | 3 | 1.8 |
| **Previous deaths** | | |
| 0 | 160 | 97.0 |
| 1 | 4 | 2.4 |
| 2 | 1 | 0.6 |
| **Previous contraceptive use** | | |
| No | 154 | 93.3 |
| Yes | 11 | 6.7 |
| Total | 165 | 100.0 |

The association between the parity and postpartum depression was not statistically significant. The association between the previous abortions and postpartum depression was not statistically significant. 41.4% of the women had complication of labour and postpartum depression. The association between the postnatal days and postpartum depression was statistically significant. 35.4% of the women who had undergone LSCS had postpartum depression. The association between the mode of delivery and postpartum depression was statistically significant. The association between the gender of the baby and postpartum depression was statistically significant (Table 6).

**Table 4: Distribution of study subjects according to the outcome of pregnancy.**

| Complication of labour | N | Percentage |
|---|---|---|
| No | 136 | 82.4 |
| Yes | 29 | 17.6 |
| **Mode of delivery** | | |
| FTND | 100 | 60.6 |
| LSCS | 65 | 39.4 |
| **Gender of the baby** | | |
| Male | 90 | 54 |
| Female | 75 | 46 |
| **Birth weight of baby in kg** | | |
| ≤2.5 | 58 | 35.2 |
| 2.6-3.5 | 98 | 59.4 |
| 3.6+ | 9 | 5.5 |
| Total | 165 | 100.0 |

FTND: Full term normal delivery, LSCS: lower segment cesarean section

**Table 5: Distribution of study subjects according to postpartum depression (PPD) score.**

| Postpartum depression score | N | Percentage | | |
|---|---|---|---|---|
| **≤10 (PPD absent)** | 132 | 80.0 | | |
| **11+ (PPD present)** | 33 | 20.0 | | |
| **Total** | 165 | 100.0 | | |
| **In the past seven days,** | **Score** | | | |
| **Questions** | **0** | **1** | **2** | **3** |
| 1. I have been able to laugh and see the funny side of things | 131 | 32 | 2 | 0 |
| 2. I have looked forward with enjoyment to things. | 124 | 38 | 3 | 0 |
| 3. I have blamed myself unnecessarily when things went wrong | 45 | 98 | 20 | 2 |
| 4. I have been anxious or worried for no good reason | 7 | 55 | 98 | 5 |
| 5.I have felt scared or panicky for no good reason | 16 | 51 | 93 | 5 |
| 6.Things have been getting on top of me | 83 | 70 | 11 | 1 |
| 7. I have been so unhappy that I have had difficulty sleeping | 6 | 99 | 50 | 10 |
| 8. I have felt sad or miserable | 53 | 92 | 16 | 4 |
| 9. I have been so unhappy that I have been crying | 135 | 15 | 14 | 1 |
| 10. The thoughts of harming myself has occurred to me | 164 | 1 | 0 | 0 |

**Table 5: Association between the postpartum depression score and their determinants.**

| Variables | | Post-partum depression score ≤10 (PPD Absent) No | % | 11+ (PPD Present) No | % | Chi-square | P value |
|---|---|---|---|---|---|---|---|
| **Birth weight of the neonate in Kg** | ≤2.5 | 49 | 84.50 | 9 | 15.50 | 1.85 | 0.39 |
| | 2.6 - 3.5 | 77 | 78.60 | 21 | 21.40 | | |
| | 3.6+ | 6 | 66.70 | 3 | 33.30 | | |
| **Duration of marriage in years** | ≤5 | 94 | 79.70 | 24 | 20.30 | 0.85 | 0.83 |
| | 06-10 | 29 | 78.40 | 8 | 21.60 | | |
| | 11-15 | 7 | 87.50 | 1 | 12.50 | | |
| | 16+ | 2 | 100.00 | 0 | 0.00 | | |

Continued.

| Variables | | Post-partum depression score ≤10 (PPD Absent) No | % | 11+ (PPD Present) No | % | Chi-square | P value |
|---|---|---|---|---|---|---|---|
| **Parity** | 1 | 55 | 83.30 | 11 | 16.70 | 4.21 | 0.51 |
| | 2 | 51 | 75.00 | 17 | 25.00 | | |
| | 3 | 16 | 76.20 | 5 | 23.80 | | |
| | 4 | 7 | 100.00 | 0 | 0.00 | | |
| | 5 | 2 | 100.00 | 0 | 0.00 | | |
| | 7 | 1 | 100.00 | 0 | 0.00 | | |
| **Previous abortions** | 0 | 125 | 81.70 | 28 | 18.30 | 5.35 | 0.06 |
| | 1 | 6 | 66.70 | 3 | 33.30 | | |
| | 2 | 1 | 33.30 | 2 | 66.70 | | |
| **Post-natal days** | ≤30 | 40 | 78.40 | 11 | 21.60 | 1.64 | 0.64 |
| | 31 - 35 | 38 | 86.40 | 6 | 13.60 | | |
| | 36 - 40 | 28 | 75.70 | 9 | 24.30 | | |
| | 41+ | 26 | 78.80 | 7 | 21.20 | | |
| **Socio-economic status (Acc. To modified BG Prasad classification)** | 1 | 3 | 100.00 | 0 | 0.00 | 11.9 | 0.018 |
| | 2 | 8 | 50.00 | 8 | 50.00 | | |
| | 3 | 28 | 90.30 | 3 | 9.70 | | |
| | 4 | 54 | 81.80 | 12 | 18.20 | | |
| | 5 | 39 | 79.60 | 10 | 20.40 | | |
| **Complications of Labor** | Yes | 115 | 84.60 | 21 | 15.40 | 10.05 | 0.002 |
| | No | 17 | 58.60 | 12 | 41.40 | | |
| **Mode of delivery** | FTND | 90 | 90.00 | 10 | 10.00 | 15.86 | 0.001 |
| | LSCS | 42 | 64.60 | 23 | 35.40 | | |
| **Gender of baby** | Male | 66 | 73.30 | 24 | 26.70 | 5.31 | 0.02 |
| | Female | 65 | 87.80 | 9 | 12.20 | | |

## DISCUSSION

The prevalence of PPD in the present study was found to be 20% which is consistent with other studies conducted in India with little variations. In the study of prevalence and risk factors of PPD by Gupta et al in north Indian women, 15.8% were diagnosed with depression.[26] In a quantitative study from rural south India (Tamil Nadu) by Savarimuthu et al, 26.3% were diagnosed to have PPD.[27] In study of mothers in Goa, 23% were considered to have postnatal depression. The prevalence appears to be more when compared to 10-15% of mothers affected with PPD in the Western economically developed societies.[28,29] Our study showed significant association with poor socioeconomic status, complication during labour, mode of delivery, gender of the baby. Contradictory to other studies, the present study does not show any association with the parity of mother, duration of marriage, birth weight of the baby and previous abortions of the mother.

Significant association is found between gender of the baby and PPD. Among the sample size of 165, with 90 male babies and 75 female babies born to mothers agreed to participate in the study, mothers of 24 male child and 9 female children were found to be in the state of possible depression i.e., 26.7% mothers having male child and 12.2% mothers having female child were affected by PPD. This shows that mothers having a male child were more likely to go under possible PPD when compared to mothers having a female child. This is contradictory to other studies where mothers with a female child or unwanted child (due to wanting of male child) undergo PPD.[26-28] The possible reason for this variation could be due to possible change in trend and changing mindset of the mothers regarding the wanting of a male child, and realising the importance of female child in the society. This might also be due to any hormonal factors following labour. Appropriate research work in this area have not been conducted and calls for the need for research regarding risk factors leading to depression in postpartum mothers having a male child.

Statistically significant association was found with poor socioeconomic status and prevalence of PPD. In present study, 36.36% and 30.30% of mothers in possible PPD belonged to class IV and class V socio-economic status of modified B. G. Prasad classification respectively. 24.4% of mothers also belonged to class II were at risk to develop major PPD. Similar association were noted in studies by Lee et al and Gupta et al.[25,26] Low socioeconomic status due to low income and low occupational status leads to increased susceptibility to infections and poor health status of mother, leading to depressive symptoms in mother.

Our finding also showed that mode of delivery of mother and subsequent complications of mother during labour has statistically significant association with PPD. 41.4% mothers facing complications at the time of labour are in risk of developing depression. Of the total 33 mothers, in

the present study, 10% had a normal FTND and 35.4% underwent caesarean section for the delivery of the baby. This shows a significant association with LSCS and developing depression in the postnatal period. Since most of the mothers belong to low socioeconomic status, the authors of the present study are of the opinion that the thought of expenditure for the operative procedure for delivery and the money spent on the subsequent hospital stay of oneself, leads the mother to over-think regarding the cost required for the future of the child and also for the present expenditure of the family owing to the increasing cost of living in the present situation. This leads to subsequent mood changes in the mother and tend to suffer more from postpartum depression. However, other studies do not show any significant association of mode of delivery and PPD.[31-32]

Low health status of the mother clinically diagnosed with pallor (with mild to severe anaemia) in the present study has statistically significant association with PPD. This observation is contrary to other studies which showed no association of PPD to anaemia in China.[30] The reason for this contrary result might be due to the false perception of the mothers regarding the free iron and folic acid supplementation given to the pregnant mothers by the government of India. The mothers are found to discard the free tablets given to them, hence leading to poor health status and predisposition to various infections due to anaemia. Neglect of the child, irritability of mother due to poor health, leads to depressive symptoms.

This study being cross sectional in nature, it is not known whether the risk factors occur prior to or after the depressive period. This means that a factor can both be a risk factor or the consequence of the depressive disorder. But PPD can't be causal to the majority of risk factors such as illiteracy, low socioeconomic status, and giving birth to girl child in the study. On the other hand, these factors can be causal to depression. Prevalence detected by the study may be an underestimation of the problem as some women who are depressed may not turn up in the hospital. Hence community-based survey and prospective studies are better designs for these situations. Some factors (e.g., somatic illness, bio- hormonal factors) were not considered in the present study, which may have a role in PPD. This was just a screening test and the mothers with possible PPD were sent to consult a psychiatrist for further evaluation.

## CONCLUSION

Postpartum depression, as evident from the study, is a major public health problem which usually goes missed during the evaluation of mother and child's health during mothers' reproductive period. Healthy mother both mentally and physically, leads to healthy development of the children who are the future of progressive India. Hence Women should be screened for potential risk factors and depressive symptoms during pregnancy and postpartum periods so that appropriate interventions, if needed, can be initiated in a timely fashion. And further initiatives to be taken to include the screening of mother's mental health in the maternal and child health programme of India.

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