EVALUATION AND ANALYSIS OF RISK FACTORS AND SEVERITY OF POSTPARTUM DEPRESSION IN POSTNATAL WOMEN AT TERTIARY CARE TEACHING HOSPITAL

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Abstract:

Background: Postpartum depression (PPD) is a significant mental health concern. Understanding the risk factors associated with PPD is crucial for effective intervention and support for affected individuals. This study was carried out to identify specific risk factors contributing to the development of PPD in various demographic groups.

Methodology: A prospective observational study was conducted at Parul Sevashram Hospital over a period of 10 months. The study involved the inpatient and outpatient departments of the gynaecology and obstetrics department. Demographic details, and gynaecological and obstetrics history were collected from postnatal women, who were screened for PPD using the Edinburgh Postnatal Depression Scale (EPDS) at baseline (1st visit) and followed up a month later (2nd visit) to evaluate the prevalence of PPD. Data analysis was conducted to determine the prevalence of PPD, identify risk factors, and assess comorbid conditions in postnatal women.

Results: The prevalence of PPD following childbirth was 7.14% at the 1st visit and decreased to 3.25% at the 2nd visit, indicating a decline in symptoms over time. Factors associated with an increased risk for PPD included maternal age, low education level, cesarean delivery, giving birth to a female child, multigravida status, and a history of pregnancy loss.

Conclusion: This study highlights the importance of early identification and intervention for PPD, particularly among women with identified risk factors. By understanding and addressing these risk factors, healthcare providers can improve outcomes for postnatal women and promote maternal mental well-being.

Keywords: Postpartum Depression, risk factors, prevalence, Edinburgh postnatal depression scale, comorbid condition

Introduction

Postpartum depression (PPD) is a significant mental health concern affecting 10-15% of women worldwide following childbirth. Postpartum depression isn't classified as an individual disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM–5); rather, it is identified when a patient experiences a significant depressive episode concurrent with the peripartum onset. It is described as a major depressive episode that begins within four weeks following birth.[1] In India, each year around 22% of women suffer from PPD. [2]

Common risk factors include maternal age, low social support, female child, abusive behaviour, history of depression, family income, unwanted pregnancy, mothers' disease condition before, during, or after pregnancy, and complications during pregnancy or labor. [2][3][4][5]

Women having a history of depression or anxiety are most likely to get PPD. After the delivery women go through major physical changes. Hormones like Estrogen and progesterone show a sudden drop in their level which causes mood changes. Low level of these hormones leads to sadness, anxiety, and depression. Social factors are also responsible for PPD. Low social support, abusive behaviour, and low economy of the family are also predictors of PPD.[6]

Symptoms include depressed mood, excessive crying too, difficulty in connecting with the child, loss of appetite, difficulty sleeping, loss of energy, irritability, anger, feelings of hopelessness, worthlessness and guilt, difficulty concentrating, restlessness, severe anxiety, panic attacks, thoughts of harming themselves or baby, thoughts of death or suicide.[6][7]

Methodology

A prospective observational study was carried out in the IPD and OPD of the gynaecology and obstetrics department, at Parul Sevashram Hospital over a period of 10 months. The study included 154 postnatal women between the age of 18 to 49 years old and who gave consent for the study. Females with a past or current psychiatric condition and on any psychiatric treatment and women who have experienced a recent traumatic event, miscarriage, or significant loss during the pregnancy were excluded from the study. In this study, patient demographic details, and gynaecological and obstetrics history was collected. The women were screened at baseline following childbirth (1st visit) by the Edinburgh Postnatal Depression Scale (EPDS). The counselling regarding PPD was carried out on the same visit before assessing baseline PPD and providing basic information regarding PPD. Follow-up was taken after a month of baseline screening (2nd visit) to evaluate the impact of counselling by EPDS.

Ethical Approval

The study was initiated after receiving ethical approval from the Institutional Ethics Committee of Parul University. Consent was obtained from the participants before enrolling them into the study.

Statistical analysis

All the data was gathered and transcribed into Microsoft Excel. After the data collection procedure, all the data was exported to statistical software for statistical analysis. All the quantitative data was represented in percentage, tables, and graphs. Comparative statistical differences were calculated using the chi-square test and one-way ANOVA. Data was analysed using GraphPad Prism which was presented in tabular and graphical form.

Results

In the study, a total of 154 postnatal mothers were screened for postpartum depression. The Edinburgh Postnatal Depression Scale (EPDS) was used to assess the prevalence of postpartum depression (PPD). The prevalence of PPD was found to be 7.14% on 1st visit and 3.25% on the 2nd visit. Among the participants, the majority (80.52%) were aged 18-28, while 18.18% were in the 29-39 age group, and only 1.30% were aged 40-49. In terms of education, 5.19% were illiterate, 75.97% had primary education, 10.39% had secondary education, and 7.15% were graduates, while only 1.30% had

postgraduate education. The most commonly observed comorbid conditions among postnatal women were sickle cell(43.59%), hypothyroidism(25.64%), and hypertension(25.64%) respectively. Diabetes was observed in only 5.13% of the women. Normal delivery was the most common (53.90%), followed by elective cesarean section (25.97%), and emergency cesarean section (20.13%). Multigravida (59.74%) women were more compared to primigravida (40.26%). The majority of participants were housewives (96.10%), with only 3.90% being employed. The gender distribution among newborns was nearly equal, with 50.32% female and 49.68% male. In terms of pregnancy loss, 76.62% had no history, 18.83% experienced one loss, 3.90% faced two losses, and 0.65% encountered three losses. (Table 1)

Variables	No. of Patients	Percentage
Age		
18-28	124	80.52%
29-39	28	18.18%
40-49	2	1.30%
Education		
Illiterate	8	5.19%
Primary	117	75.97%
Secondary	16	10.39%
Graduate	11	7.14%
Post-graduate	2	1.30%
Comorbid Condition		
Sickle cell	17	43.59%
Hypothyroidism	10	25.64%
Diabetes mellitus	2	5.13%
Hypertension	10	25.64%
Type of Delivery		
Normal	83	53.90%
Elective c section	40	25.97%
Emergency c section	31	20.13%
Gravida		
Primi-gravida	62	40.26%
Multi-gravida	92	59.74%
Occupation		
Housewife	148	96.10%
Employed	6	3.90%
Gender of newborn		
Female	78	50.65%
Male	76	49.35%

Pregnancy Loss		
0	118	76.62%
1	29	18.83%
2	6	3.90%
3	1	0.65%

Table 1 Demographic and Obstetric Characteristics of Postnatal Women

Table 2 represents various factors influencing the prevalence of postpartum depression. Across all age groups, there was a decline in depression cases from the initial to the follow-up. In the 18-28 age group, initially, depression was observed in 7 mothers which decreased to 3 in the subsequent visit, while the number of non-depressed individuals increased from 117 to 121, resulting in a chi-square test significance of p-value = 0.0002. Similarly, in the 29-39 age group, depression reduced from 4 to 2 cases, indicating a notable trend across different age groups. In the 40-49 age group, where only two individuals were observed, both remained free from depression throughout the visits.

The highest prevalence of depression was observed among women with primary education. During the first visit, 10 women were depressed, which decreased to 5 in the second visit. Conversely, illiterate women showed no signs of depression. similarly, there were no cases of PPD recorded among graduates and post-graduates. These data gave a p-value of 0.0001 indicating statistical significance

Comorbid conditions showed distinct associations. Initially, one case of PPD was observed among patients with sickle cell and hypothyroidism. However, on the follow-up visit, depression persisted only in a patient with sickle cell. Notably, no signs of depression were observed among individuals with diabetes or hypertension at either visit.

On the initial visit, 4 women who underwent normal deliveries exhibited depressive symptoms, by the subsequent visit depression was reduced and was observed in only 2 individuals. Women who opted for elective C-sections had consistent rates of depression, whereas those with emergency C-sections showed a notable decline from 4 mothers to none in subsequent visits. The chi-square test indicated significant differences in depression prevalence based on the type of delivery (p-value = 0.0342).

Furthermore, multiple pregnancies emerged as a significant factor, with the number of pregnancies influencing PPD prevalence. Depression was more prevalent among multigravida compared to primi-gravida. Among primi-gravida, only 2 were depressed while in the multi-gravida group, 9 women exhibited the sign of depression. However, during the second visit, depression was decreased in both groups. The One-way ANOVA test underscored the significance of pregnancy in the prevalence of PPD. (p-value = 0.0333).

Socio-economic factors, such as employment status, and the gender of the child, also influenced PPD prevalence. Initially, 11 housewives exhibited depression, decreasing to 5 in subsequent visits, while employed women showed no depressive symptoms in either visit, with a chi-square test significance of p-value = 0.0154. Additionally, depression rates varied based on the gender of the child, depression was more prevalent among women with a female child compared to women with a male child.

Pregnancy loss demonstrated profound impacts on the prevalence of PPD. The chi-square test emphasized the significance of pregnancy loss in the prevalence of PPD. (p-value < 0.0001).

Variable	No. of Patients (1st visit)		No. of Patients (2nd visit)		P-Value
	Depressed N=11(%)	**Non Depressed N=143(%)**	**Depressed N=5(%)**	**Non Depressed N=149(%)**	
Age					
18-28	7(5.65%)	117(94.35%)	3(2.42%)	121(9768%)	0.0002
29-39	4(14.29%)	24(85.71%)	2(7.14%)	26(92.86%)	
40-49	0(0%)	2(100%)	0(0%)	2(100%)	

Education					
Illiterate	0(0%)	8(100%)	0(0%)	8(100%)	0.0001
Primary	10(8.55%)	107(91.45%)	5(4.27%)	112(95.73%)	
Secondary	1(6.25%)	15(93.75%)	0(0%)	16(100%)	
Graduate	0(0%)	11(100%)	0(0%)	11(100%)	
Post-graduate	0(0%)	2(100%)	0(0%)	2(100%)	
Comorbid Condition					
Sickle cell	1(5.88%)	16(94.12%)	1(5.88%)	16(94.12%)	<0.0001
Hypothyroidism	1(10%)	9(90%)	0(0%)	10(100%)	
Diabetes mellitus	0(0%)	2(100%)	0(0%)	2(100%)	
Hypertension	0(0%)	10(100%)	0(0%)	10(100%)	
Delivery Type					
Normal	4(4.82%)	79(95.18%)	2(2.41%)	81(97.59%)	0.0342
Elective c section	3(7.50%)	37(92.50%)	3(7.50%)	37(92.50%)	
Emergency c section	4(12.90%)	27(87.10%)	0(0%)	31(100%)	
Occupation					
Housewife	11(7.43%)	137(92.57%)	5(3.38%)	143(96.62%)	0.0154
Employed	0(0%)	6(100%)	0(0%)	6(100%)	
Gravida					
Primi	2(3.23%)	60(96.77%)	1(1.61%)	61(98.39%)	0.0333
Multi	9(9.78%)	83(90.22%)	4(4.35%)	88(95.65%)	
Gender of newborn					
Female	7(8.97%)	71(91.03%)	5(6.41%)	73(93.59%)	0.0359
Male	4(5.26%)	72(94.74%)	0(0%)	76(100%)	
Pregnancy Loss					
0	5(4.24%)	113(95.76%)	2(1.69%)	116(98.31%)	<0.0001
1	3(10.34%)	26(89.66%)	1(3.45%)	28(96.55%)	
2	2(33.33%)	4(66.67%)	1(16.67%)	5(83.33%)	
3	1(100%)	0(0%)	1(100%)	0(0%)	

Table 2 Factors Influencing Prevalence of Postpartum Depression

Discussion

This study aimed to evaluate and analyse risk factors and assess the prevalence of postpartum depression in postnatal women at a tertiary care teaching hospital. The study was conducted in two

phases which included 154 postnatal women. Patient's demographical details and obstetrics history were collected and were assessed using the Edinburgh postnatal depression scale (EPDS) to find the prevalence of postpartum depression.

In our study, we analysed the association between postpartum depression with various demographic factors. By analysing data from two visits, we compared depressed women and non-depressed women across different demographic categories.

The preliminary findings revealed that the prevalence of postpartum depression was 7.14% (N=11) during the first visit which subsequently decreased to 3.25% (N=5) during a follow-up visit. The results were consistent with the study conducted by Hanach, et al. (2022)[7] and Hadia, et al. (2022)[8] suggesting that the prevalence of postpartum depression was higher immediately after childbirth and gradually decreased over time. However, our study reported a lower prevalence of postpartum depression compared to previous studies. It could be due to the cut-off score of EPDS. Hadia, et al.(2022)[8] utilized an EPDS score >8, while Hanach, et al.(2022)[8] used a cut-off score of 12 as an indicator for postpartum depression. Additionally, differences in the study site, study duration, and methodology, could be responsible for different results.

The study enrolled 154 postnatal women, with the majority, 80.52% (N=124) falling into the 18-28 age group, followed by, 18.18% (N=28) in the 29-39 age group, and only 1.30% (N=2) in the 40-49 age group. On comparing the demographic data, it was observed that depression was associated with the age group. During the initial screening, among the 18-28 age group, 5.65% (N=7) were depressed, while 94.35% (N=117) were non-depressed. However, by the 2nd visit, depression reduced to 2.42% (N=3). In the 29-39 age group, 14.29% (N=4) were depressed, while 85.71% (N=24) did not exhibit depressive symptoms. Only 2 women were in the 40-49 age group, and none of them showed signs of depression in either visit. Overall, there was a decline in cases of depression across all age groups between the first and second visit. The findings indicate that maternal age was associated with postpartum depression. Similar results were found by Hanach, et al.(2022)[7] indicating younger maternal age to be a risk factor for postpartum depression. However, Fan Q, et al.(2020)[3] found a higher prevalence of postpartum depression among women aged over 35 at delivery.

In our study majority of patients accounting for 75.97% (N=117), had only completed their primary education, with 5.19% (N=8) being illiterate, 10.39% (N=16) having secondary education and 7.15% (N=11) being graduates. The post-graduates were the least comprising only 1.30% (N=2). Illiterate participants showed no sign of depression on either visit. The prevalence of depression among those with primary education was initially 8.55% (N=10), which decreased to 4.27% (N=5) during the follow-up visit. Among the women with secondary education, only 6.25% (N=1) were depressed during the initial visit. While on the second visit, no one exhibited any sign of depression. Among graduates and post-graduates, no depressed patients were identified in either visit. These findings suggest that higher education levels correlate with lower depression rates. Higher education leads to greater health literacy, which includes awareness of mental health concerns and availability of suitable treatment, while less education may lead to delays in diagnosing and treating PPD. Coping strategies and self-esteem can also be influenced by education. Those with higher education levels may be better equipped to handle the stressors of parenting and lower their chance of developing PPD. Similar results were reported by Hadia, et al. (2022).[8] Their study of 120 postnatal women also indicated that lower education levels were associated with a higher risk of postpartum depression.

Among 154 postnatal women, 39 patients were found to have co-morbid conditions. The most prevalent condition was sickle cell disease, affecting 43.59% (N=17) of patients, followed by hypothyroidism, which was apparent in 25.64% (N=10) of patients. Diabetes was the least common condition, impacting only 5.13% (N=2) of patients, while hypertension affected 25.64% (N=10) of patients. During the initial visit, one patient with depression was identified in each of the sickle cell and hypothyroidism patient groups. However, on the second visit, only a patient with sickle cell exhibited signs of postpartum depression. Patients with diabetes and hypertension showed no signs of depression during both visits. Studies examining the correlation between comorbid conditions such as sickle cell, diabetes, and hypertension with postpartum depression have not been done. However,

hypothyroidism has been linked to PPD in a study conducted by Sylven, et al.(2012).[9] The study found that increased TSH levels were associated with depression at 6 months postpartum indicating a connection between hypothyroidism and postpartum depression.

The majority of patients underwent normal delivery, accounting for 53.90% (N=83), followed by elective cesarean at 25.97% (N=40), and emergency cesarean section at 20.13% (N=31). During the initial visit, 4.82% (N=4) of women who had normal delivery were depressed, while only 2.41% (N=2) exhibited depressive symptoms during the second visit. Among those who opted for an elective cesarean section, 7.50% (N=3) experienced depression during both visits. However, among women who had emergency cesarean section, 12.90% (N=4) exhibited signs of depression during the initial visit, with no cases reported during a follow-up visit. A similar study was conducted by Meky, et al.(2019)[10] to find the correlation between postpartum depression and mode of delivery. Their findings indicate that postpartum depression was significantly higher in the emergency cesarean section group at the 8th and 16th postnatal weeks compared to both elective cesarean section and normal delivery. Similar results were found in the study conducted by Nasr, et al.(2020)[11] indicating cesarean section as a risk factor for postpartum depression. For certain mothers, particularly those who had not planned for a C-section, the procedure can be unpleasant or cause trauma. Emotional discomfort, a sense of loss of control, and disappointment can result from this, and these could trigger postpartum depression.

Among 154 postnatal women 40.26% (N=62) were primi-gravida, while 59.74% (N=92) were multigravida. From the primigravida group, 3.23% (N=2) of women experienced postpartum depression during the initial visit. By the second visit, the cases of depression were reduced to 1.61% (N=1). Initially, 9.78% (N=9) of women exhibited symptoms of postpartum depression in the multi-gravida group. On the subsequent visit, only 4.35% (N=4) screened positive for depression. These results align with the study conducted by Sabita, et al. (2019)[12] who found that multigravida women had higher odds of postpartum depression compared to primi-gravida. Multiple pregnancies can result in increased emotional and physical strain. Additionally, they can alter the dynamics of a family and have a financial impact, leading to stress and anxiety.

Out of 154 patients, most of the women comprising 96.10% (N=148), were housewives, while only 3.90% (N=6) were employed. Among the housewives, 7.43% (N=11) were diagnosed with postpartum depression during the initial visit, while 92.57% (N=137) did not exhibit any signs of depression. By the second visit, the number of depressed housewives was reduced to 3.38% (N=5). Meanwhile, all 6 employed women showed no signs of depression during either visit. While no specific studies directly correlate the prevalence of depression with housewives, Hanach, et al. (2022)[7] did find a higher prevalence of postpartum depression among unemployed women compared to employed women. The transition to motherhood can be challenging, particularly for housewives, as it often requires them to make significant adjustments to their roles and responsibilities. Juggling the demands of caring for a newborn, managing household responsibilities, and potentially taking care of other family members can lead to feelings of overwhelming stress and anxiety, thereby increasing the risk of postpartum depression (PPD).

Among postnatal women, 50.32% (N=78) gave birth to a female child while 49.38% (N=76) had a male child. Out of those who had a female child, 8.97% (N=7) experienced depression during their initial visit, while 91.03% (N=71) were not depressed. By the subsequent visit, the number of depressed women was reduced to 6.41% (N=5). Among those who had a male child, 5.26% (N=4) were depressed during their first visit, whereas 94.74% (N=72) were not. No cases of depression were reported during the follow-up visit among mothers with a male child. The association between PPD and having a female child was observed in the study conducted by Hadia, et al. (2022)[8] where they found a higher prevalence of postpartum depression among women with more than 1 female child. In our society, there is pressure on women to have a male child. It is believed that the birth of a female child increases the responsibility and financial burden on the family. This societal pressure can contribute to increased stress and anxiety, increasing the risk of PPD.

A majority, comprising 76.62% (N=118), did not have a history of abortion or miscarriage. However, 18.83% (N=29) experienced the loss of one pregnancy, while 3.90% (N=6) had two pregnancy losses, and only 0.65% (N=1) faced the loss of three pregnancies. Among those with no prior history of infant loss, 4.24% (N=5) of women exhibited signs of depression during their initial visit, which reduced to 1.69% (N=2) during the second visit. In the initial visit, 10.34% (N=3) of women who lost one pregnancy were depressed. On the follow-up visit, depressed women were reduced to 3.45% (N=1). Among those who lost two pregnancies, 33.33% (N=2) of women were depressed initially, while on the second visit, only 16.67% (N=1) women were depressed. In the study, there was only one woman, who had lost three pregnancies and was consistently observed to be depressed across both visits. A similar study was conducted by Agarwala, et al. (2019)[2] indicating that a history of abortion or miscarriage was a predictor of PPD. Mothers who have experienced pregnancy loss may be more prone to an increased risk of depression and anxiety during subsequent pregnancies and the postpartum period. Fear of another loss and concerns about parenting after loss can contribute to higher levels of stress and anxiety, making individuals more vulnerable to postpartum depression.

CONCLUSION

The study aimed to evaluate and analyse the risk factors and severity of postpartum depression (PPD) in postnatal women. The findings indicate that the prevalence of postpartum depression was more immediately after childbirth and decreased after one month, suggesting that the severity of postpartum depression is more immediately after childbirth and decreases gradually over time. The majority of affected women fell within the 18-28 age group, highlighting younger maternal age as a significant risk factor. Additionally, a low educational level emerged as a contributing factor, with a majority of women having completed only primary education. Obstetric factors such as the mode of delivery were also implicated, as women undergoing cesarean sections appeared to be more susceptible to PPD. Furthermore, the gender of the newborn played a role, with a higher prevalence observed among mothers of female infants. Among multigravida women a larger proportion were affected, indicating a potential effect of multiple pregnancies on mental health. Comorbid conditions such as sickle cell disease, hypothyroidism, and hypertension were prevalent among postnatal women, though they did not have any significant relationship with PPD. Women who had a history of abortion, miscarriage, or pregnancies that ended in stillbirth or neonatal death were also at risk of PPD. The study highlights the importance of recognizing and addressing PPD in postnatal care. Early screening using tools like the Edinburgh Postnatal Depression Scale (EPDS) can facilitate timely intervention and support for at-risk women. Moreover, targeted interventions tailored to specific demographic groups, such as younger mothers and those with lower educational level, may help mitigate the risk of PPD. This study provides valuable insights into the prevalence, risk factors, and severity of postpartum depression among postnatal women in a tertiary care teaching hospital by identifying demographic and obstetric correlates of PPD.

LIMITATIONS

- The study's sample size and location may limit the findings. Conducting the study at a single site in a specific region might not capture the diverse factors that influence PPD in different populations or settings.
- Another limitation was the timing of the assessment of PPD, which had a relatively short duration of follow-up with only a one-month interval between the first and second visit. PPD can persist or even develop after this period, so longer follow-up might reveal different prevalence rates and risk factors.

FUTURE SCOPE

- Conducting a longitudinal study with extended follow-up periods beyond one month can provide a more comprehensive understanding of postpartum depression (PPD). This approach can allow us

to determine the risk factors and prevalence of postpartum depression over time, as well as the long-term impact of PPD on the health and well-being of mothers and infants can be identified.

- Furthermore, conducting a multisite study and comparing the prevalence and risk factors of PPD across different geographic regions, cultural backgrounds, and healthcare settings could provide valuable insights into the influence of sociocultural factors on PPD.
- Implementing interventions aimed at preventing or managing PPD based on identified risk factors could be an essential step in reducing the incidence and severity of PPD. Integrating mental health screening and support into routine prenatal and postnatal care can help identify at-risk individuals early and provide timely interventions. By effectively identifying, preventing, and managing PPD, the well-being of mothers can be improved.

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