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Psychiatric Morbidity in Postpartum Women: A Hospital Based Cross Sectional Study

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Abstract

Context: The transition to motherhood brings about significant psychological and biological changes, making both pregnancy and the postpartum period are particularly susceptible to health challenges. Mental health issues during this time have often been neglected within the realm of reproductive health, despite their substantial contribution to the global burden of illness and disability. These conditions are associated with a range of symptoms including abnormally high or low mood, irritability, disturbed sleep, hallucinations/delusions, and occasionally suicidal or infanticidal ideation, if not treated promptly, they can substantially impact upon the mother's health, mother-infant bonding, and family dynamics.

Aim: To study psychiatric morbidity in women during postpartum period.

Settings and Design: Hospital based cross sectional study.

Methods and Material: This is an observational, hospital-based cross-sectional study conducted on postpartum women visiting immunization clinic for first immunization of their babies within 6 weeks of delivery, who fulfil the inclusion and exclusion criteria.

The sample size estimated is 100. Assessment tools used are Predesigned questionnaire, Edinburgh postnatal depression scale, BPRS and HAM A.

Statistical analysis used: The data were analysed using IBM SPSS version 29. Continuous and categorical variables have been presented as mean ± standard deviation and percentages respectively.

Results: The population studied tends to be younger (mean age of 27.4+5), predominantly from rural areas (65%), and with limited educational attainment (71% either illiterate or with only primary education) and majority come from lower socio-economic backgrounds. Psychiatric morbidity is mainly in the form of depression (31%) followed by anxiety (17%) with very low prevalence of psychosis (3%). This population appears to face socio-economic and educational disadvantages, but in our study no statistical significance was found between variants like socio economic status, religion and psychiatric morbidity.

Conclusions: The study found that postpartum psychiatric morbidity, particularly depression (31%) and anxiety (17%), is common, while psychosis is rare (3%). No significant

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association was observed between psychiatric morbidity and socio-demographic factors like socio-economic status or religion. These findings highlight the need for broader mental health support for postpartum women, regardless of socio-demographic backgrounds. A larger sample size with prospective assessment is recommended to validate these results.

Keywords: Postpartum women, Psychiatric morbidity, Postpartum depression and anxiety.

Key Messages: The study highlights that postpartum depression and anxiety are common, while psychosis is rare. Socio-demographic factors such as socio-economic status and religion are not significantly linked to psychiatric morbidity, emphasizing the need for universal mental health support for postpartum women.

INTRODUCTION

The transition to motherhood brings about significant psychological and biological changes, making both pregnancy and the postpartum period are particularly susceptible to health challenges.[1-3] Mental health issues during this time have often been neglected within the realm of reproductive health, despite their substantial contribution to the global burden of illness and disability.[4] These conditions are associated with a range of symptoms including abnormally high or low mood, irritability, disturbed sleep, hallucinations/delusions, and occasionally suicidal or infanticidal ideation, if not treated promptly, they can substantially impact upon the mother's health, mother-infant bonding, and family dynamics. The period following childbirth is marked by an increased susceptibility to mood disturbances, particularly depressive symptoms. [2] In the International Classification of Diseases, 10th Edition (ICD-10), postpartum disorders are categorized under behavioural syndromes linked to physiological disturbances and physical factors. They are classified as "mental and behavioural disorders associated with the puerperium, not elsewhere classified" (F53.0–F53.9). According to ICD-10, the duration criterion for these disorders is set at six weeks. In contrast, the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), replaced the specifier "with postpartum onset" with "with peripartum onset." This specifier applies when mood symptoms emerge during pregnancy or within the first four weeks after childbirth. According to a review article done by Upadhyay RP *et al*[5], prevalence of postpartum depression in Indian mothers was 22%.Hence the aim of the study was to assess the psychiatric morbidity and its corelation with specific sociodemographic variables in a tertiary care hospital.

MATERIALS AND METHODS

This is an observational, hospital-based cross-sectional study conducted on postpartum women visiting immunization clinic for first immunization of their babies within 6 weeks of delivery, who fulfil the inclusion and exclusion criteria. After obtaining clearance from Institutional Ethical Committee, study was conducted at S. Nijalingappa Medical College & HSK Hospital from May 2023 to July 2023. The subjects were explained in their language about the purpose of the study and that their identity will not be revealed in the published material. Then, written consent was taken on the consent form before recruiting them. The estimated sample size is 100.

The sample size for the present study was calculated based on the average prevalence of post-partum mental disorders- from a systematic review by Ravi Prakash *et al*[5], using the formula,

$$N' = \frac{N * (Z^2 * P * Q)}{[(d^2 (N-1)) + (Z^2 * P * Q)]}$$

where,

N' = Sample size adjusted for a finite population size

N = Known finite sample size in the population = Approximately 135 post-partum patients available at the study center for a duration of 3 months (on an average 45 patients per month)

Z = Critical value for a corresponding level of confidence = 1.96 for 95% confidence level

P = Pooled prevalence of post-partum mental disorders from the systematic review and meta-analysis = 20%

q = 100- 20= 80%

d = Acceptable margin of error = 5%

Substituting the above values in the formula,

n = 88

Thus, a minimum sample of 88 patients was required for an error rate of 5% and 95% confidence levels. We rounded it to 100 patients for our study.

All consenting patients who are in the postpartum period (<6 weeks as per ICD 10) were the study subjects. Inclusion criteria: a) women up to six weeks post-partum, b) Age >18 years, c) Willing to give written informed consent, and d) accompanied by attender. Women were excluded if they reported the onset of the current psychiatric disorder prior to pregnancy and during pregnancy or if they had any co-morbid medical illnesses.

Assessment tools used are Predesigned questionnaire, Edinburgh postnatal depression scale, BPRS and HAM A. Predesigned interview questionnaire consisted of sociodemographic details like name, age of the patient, place, socio economic status, educational status, occupation of the patient, date of delivery, past history of psychiatric illness and family history of psychiatric illness. Edinburgh Postnatal Depression Scale (EPDS)[6] was developed to help healthcare professionals identify mothers experiencing postpartum depression, a condition more persistent and severe than the "baby blues," which typically occurs within the first week after childbirth. The scale comprises 10 brief statements, and the mother selects one of four options that best reflects how she has felt over the past week. Most mothers can complete the scale in less than five minutes. Responses are scored from 0 to 3, depending on the severity of symptoms, with items 3 and 5 to 10 being reverse-scored (3, 2, 1, 0). A total score is calculated by summing the individual item scores. Mothers who score above 12 or 13 are likely experiencing depression and should seek medical attention.

The Hamilton Anxiety Rating Scale (HAM-A)[7] is a widely used clinical tool for assessing the severity of anxiety symptoms. It consists of 14 items, each rated on a scale from 0 to 4, measuring both psychological (e.g., mental distress, fears) and physical (e.g., somatic complaints) components of anxiety. In postpartum women, HAM-A can be particularly useful for detecting anxiety disorders, which are common in the postpartum period but often underdiagnosed. By identifying both mental and physical signs of anxiety, the HAM-A helps clinicians evaluate the impact of anxiety on a mother's well-being.

The Brief Psychiatric Rating Scale (BPRS)[8,9] is a clinical tool designed to assess the severity of psychiatric symptoms, including depression, anxiety, hallucinations, and delusions. It consists of 18 items rated on a scale from 1 to 7, providing a comprehensive overview of a patient's mental state. In the context of postpartum psychosis, BPRS is valuable for detecting and evaluating psychotic symptoms, such as delusions, hallucinations, and disorganized thinking, which may emerge during or after childbirth. Timely assessment with the BPRS allows for early diagnosis and intervention, helping prevent severe outcomes for both the mother and infant.

Results: Participants' ages ranged from 19 to 39 years, with a mean age of 27.4 years $\pm$ 5 years (*table 1*). This suggests that the majority of participants were in their late twenties. The majority of participants (65%) came from rural areas, while 35% were from urban settings. This indicates a higher representation of rural residents in the study. The majority of the participants are Hindu (61%), followed by Muslims (32%) and Christians (7%). This distribution may reflect the local demographic characteristics. A significant proportion of participants were either illiterate (35%) or have only primary education (36%). Those with higher educational qualifications, such as higher secondary (5%) and graduates (8%), represent a smaller segment of the study population. This suggests that many participants had a lower level of formal education. The largest group falls into the "upper lower" category (34%), followed by "lower middle" (27%) and "lower" (28%). Only a small portion belongs to the "upper middle" class (11%). This indicates that the majority of participants belong to the lower socio-economic strata. Socio demographic details of participants is depicted in *table 2*. Psychiatric morbidity was mainly in the form of depression seen in 31%, followed by anxiety seen in 17%,with very low prevalence of psychosis seen in 3% of participants (*table 5*). There is no prior psychiatric illness reported in any of the participants (*table 3*) This population appears to face socio-economic and educational disadvantages, but the study found no statistically significant associations between psychiatric comorbidity and participants socio demographic variables like place of residence, religion, or socio-economic status (SES) as indicated by P-values greater than 0.05 in all cases as depicted in *table 6, table 7* and *table 8* respectively. Although there were slight variations in the prevalence of these conditions across different groups, they were not significant. A trend was observed where lower SES was linked with higher prevalence of anxiety, psychosis, and especially depression, but this was not statistically meaningful as shown in *table 8*. Overall, the findings suggest that factors such as place, religion, and SES do not play a decisive role in predicting mental health outcomes in this

population.

Table 1: Descriptive statistics for age in the study

Variable	Minimum	Maximum	Mean	Standard deviation
Age in years	19	39	27.4	5.0

- **Age Range:** Participants' ages ranged from 19 to 39 years, with a mean age of 27.4 years and a standard deviation of 5.0. This suggests that the majority of participants are in their late 20s, with some variability.

Table 2: Socio demographic profile

Socio-demographic variables	Variables classified (N=100)	n (%)
Education	Illiterate	35 (35.0)
	Primary	36 (36.0)
	School	16 (16.0)
	Higher secondary	5 (5.0)
	Graduate	8 (8.0)
Religion	Hindu	61 (61.0)
	Muslim	32 (32.0)
	Christian	7 (7.0)
Occupation	Home maker	100
	Manual	0
	Skilled	0
Socio-economic status	Upper middle	11 (11.0)
	Lower middle	27 (27.0)
	Upper lower	34 (34.0)
	Lower	28 (28.0)
Locality	Rural	65 (65.0)
	Urban	35 (35.0)

Abbreviations: [N = number of participants]

The socio-demographic table presents a breakdown of various characteristics among 100 participants in the study. Here's a summary of each section:

1. **Education**: A significant proportion of participants (35%) are illiterate, with a slight increase (36%) having attained primary education. Only a smaller percentage have completed school (16%), higher secondary (5%), or have graduated (8%).
2. **Religion**: The majority of participants identify as Hindu (61%), followed by Muslims (32%), and a smaller number are Christians (7%).
3. **Occupation**: All participants (100%) are homemakers, with no participants reporting employment in manual or skilled labor.
4. **Socio-economic Status**: Most participants fall into the upper-lower (34%) and lower (28%) socio-economic categories. A smaller proportion belongs to the lower middle (27%) and upper middle (11%) categories.
5. **Locality**: The majority of participants (65%) are from rural areas, while 35% live in urban areas.

Table 3: Distribution of patients based on past history of psychiatric illness

Past history of psychiatric illness	N	%
Yes	0	0
No	100	100.0

The *table 3* shows that none of the patients in the study had a previous history of psychiatric illness. Specifically, 100% of the participants (N=100) reported having no prior psychiatric illness.

Abbreviations: [N = number of participants]

Table 4: Descriptive statistics for number of weeks post-delivery in the study

Variable	Minimum	Maximum	Mean	Standard deviation
No of weeks	1	6	3.5	1.7

Table 4 presents the descriptive statistics for the number of weeks post-delivery among the participants. The postpartum period ranged from 1 to 6 weeks, with an average (mean) of 3.5 weeks and a standard deviation of 1.7 weeks, indicating some variation in how far postpartum the participants were.

Table 5: Distribution of psychiatric morbidity

Psychiatric morbidity	N=100
Anxiety	17
Depression	31
Psychosis	03
Total	51
Absence of psychiatric morbidity	49

Abbreviations: [N = total number of participants]

The *table 5* shows that among the 100 participants, 51 were identified with psychiatric morbidity. Specifically, 17 individuals experienced anxiety, 31 experienced depression, and 3 had psychosis. The remaining 49 participants had no psychiatric morbidity. This indicates that more than half of the participants (51%) experienced some psychiatric

issue during the study period, with depression being the most common, followed by anxiety, and a smaller number experiencing psychosis.

Table 6: Association of place of residence with anxiety, psychosis, and depression

Place	N	Anxiety		Psychosis		Depression	
	%	Present	Absent	Absent	Present	Present	Absent
Urban	N	3	32	34	1	12	23
	%	8.6%	91.4%	97.1%	2.9%	34.3%	65.7%
Rural	N	14	51	63	2	19	46
	%	21.5%	78.5%	96.9%	3.1%	29.2%	70.8%
P value		.100		.951		.602	

- The P-values for anxiety (0.100), psychosis (0.951), and depression (0.602) are all greater than 0.05, indicating **no statistically significant association** between participants' place of residence (urban or rural) and the presence of anxiety, psychosis, or depression.
- Thus, place of residence does not appear to play a major role in the occurrence of these mental health conditions within the studied population.

Abbreviations: [N = number of participants in the study]

Table 7: Association of religion with anxiety, psychosis, and depression

Religion	N	Anxiety		Psychosis		Depression	
	%	Present	Absent	Absent	Present	Present	Absent
Hindu	N	10	51	60	1	22	39
	%	16.4%	83.6%	98.4%	1.6%	36.1%	63.9%
Muslim	N	7	25	31	1	9	23
	%	21.9%	78.1%	96.9%	3.1%	28.1%	71.9%
Christian	N	0	7	6	1	0	7
	%	0.0%	100.0%	85.7%	14.3%	0.0%	100.0%
P value		.370		.178		.135	

The results show that the prevalence of anxiety, psychosis, and depression varies slightly across religious groups, but the P-values (all >0.05) indicate that none of these mental health conditions are significantly associated with religion in this study. Hence, religion does not appear to be a determining factor for anxiety, psychosis, or depression in the study participants.

Abbreviations: [N = number of participants in the study]

Table 8: Association of SES with anxiety, psychosis, and depression

SES	N	Anxiety		Psychosis		Depression	
	%	Present	Absent	Absent	Present	Present	Absent
Upper middle	N	0	11	11	0	0	11
	%	0.0%	100.0%	100.0%	0.0%	0.0%	100.0%
Lower middle	N	4	23	27	0	8	19
	%	14.8%	85.2%	100.0%	0.0%	29.6%	70.4%
Upper lower	N	7	27	33	1	12	22
	%	20.6%	79.4%	97.1%	2.9%	35.3%	64.7%
Lower	N	6	22	26	2	11	17
	%	21.4%	78.6%	92.9%	7.1%	39.3%	60.7%
P value		.385		.419		.104	

The data indicates that anxiety, psychosis, and depression are more prevalent in the lower socio-economic groups, but the P-values (all >0.05) show that these associations are not statistically significant. This suggests that, within this study, SES is not a significant factor in predicting anxiety, psychosis, or depression. Nonetheless, there is a noticeable trend where lower SES is associated with higher prevalence rates of these mental health conditions, particularly for depression.

Abbreviations: [N = number of participants in the study]

SES: Socio economic status

DISCUSSION

This is an observational, hospital-based cross-sectional study conducted on postpartum women visiting immunization clinic for first immunization of their babies within 6 weeks of delivery to assess the psychiatric morbidity and its corelation with specific sociodemographic variables in a tertiary care hospital. The postpartum period is a challenging time marked by significant biological, physical, social, and emotional changes[10] During pregnancy and the postpartum period, many women experience a wide range of intense emotions, including anticipation, excitement, happiness, and fulfilment, alongside feelings of anxiety, frustration, confusion, or sadness and guilt. The postpartum phase increases their vulnerability to various psychiatric conditions. Postpartum psychiatric disorders are typically classified into three categories: postpartum blues, postpartum psychosis, postpartum depression and in addition to these, various anxiety and stress-related disorders can occur during the puerperium.[10,11] Postpartum psychosis occurs in approximately 1 to 2 out of every 1,000 women who give birth, typically emerging within the first 2 to 4 weeks after delivery. The onset is abrupt and can appear as early as 2 to 3 days postpartum.[12,13] A community-based prospective study in India reported the incidence of postpartum depression among rural women to be approximately 11%.[14] Postpartum psychiatric syndromes are more prevalent (81%) among women under the age of 25. This trend aligns with the fact that many Indian women conceive during this period, as the average age at marriage tends to be relatively lower. [10,15] The "baby blues," experienced by about 40% of new mothers, involves relatively mild depressive symptoms that usually resolve on their own within a brief period.[16] The symptoms of postpartum depression (PPD) are similar to those of the baby blues but are more intense and last longer. PPD can develop anytime within the first year after childbirth and frequently requires medical intervention.[17] Perinatal anxiety, which is often linked to excessive worries about the baby's well-being, is estimated to affect around 20% of mothers.[18] Postpartum psychosis (PP) is the least common and often considered the most severe, affecting approximately 0.89 to 2.6 out of every 1,000 mothers.[19]

The pathogenesis of postpartum psychiatric disorders is strongly influenced by biological factors.[10] The early postpartum period is marked by a significant decline in gonadal steroids. Notably, progesterone levels decrease between the first and second stages of labour, while estrogen levels sharply drop after the placenta, which secretes estrogen, is expelled. Estrogen plays a key role in modulating the monoaminergic system, particularly affecting serotonin and dopamine, which are linked to mood and psychotic symptoms, respectively.[20,21,22] After the steroid-producing placenta is expelled and the production of gonadal hormones stabilizes post-delivery, there is a sharp and sudden drop in estrogen, progesterone, and the progesterone metabolite allopregnanolone.[23] These hormones typically affect the brain's limbic regions, which are crucial for emotional regulation, cognitive processing, motivation, and arousal, by modulating neurotransmitter activity. Abnormal sensitivity to this hormonal decline, potentially linked to maladaptive functioning of the GABA(A) receptor, has been suggested as a factor contributing to the risk of postpartum mood disorders.[17] Recent studies have highlighted the connection between allopregnanolone levels and depressive or anxiety symptoms, as well as the positive effects of allopregnanolone treatment in women with postpartum depression.[24] Although connections between postpartum mental health risks and other hormones, such as reproductive, stress, and thyroid hormones, have been proposed, they are less consistent and their impact remains uncertain.[17]

In our study, mean age of participants was 27.4 $\pm$ 5 which is similar to a study done by Muneer *et al*,[25] Srivastava AS *et al*,[26] Goyal S[1] and Gupta S *et al*.[27] The majority of participants (65%) came from rural areas, while 35% were from urban settings. This indicates a higher representation of rural residents in our study which is in line with the study done by Srivastava *et al*[26] and was different as compared to a study done by Goyal S *et al.*[1] In our study majority of the participants were Hindus (61%), followed

by Muslims (32%) and Christians (7%) which is similar to the studies done by Srivastava AS *et al*, [26]GK Poomalar *et al*,[28] and Kumar N *et al*[29] and in these studies religion did not have a statistical significance and was not a risk factor for postpartum morbidity. A significant proportion of participants were either illiterate (35%) or have only primary education (36%). Those with higher educational qualifications, such as higher secondary (5%) and graduates (8%), represented a smaller segment of the study population. This suggests that many participants had a lower level of formal education which is similar to a study done by Gupta *et al*[27] and was different when compared with a study done by Goyal S[1] where most of the participants were educated. The largest group falls into the "upper lower" category (34%), followed by "lower middle" (27%) and "lower" (28%). Only a small portion belongs to the "upper middle" class (11%). This indicates that the majority of participants belong to the lower socio-economic strata. A trend was observed where lower SES was linked with higher prevalence of anxiety, psychosis, and especially depression, but this was not statistically significant. This is similar with studies done by GK Poomalar *et al*,[28] Kumar N *et al*[29] and Saldanha D *et al*[30] but different when compared with a study conducted by Gupta S *et al*[27] in North India where low socioeconomic status had significant statistical association and was a risk factor for development of post-partum depression. In one more study done by Wan *et al*[31] involving a survey of Chinese women found that postpartum depression was linked to those in lower-income groups. In our study sample consisting of 100 participants, the overall psychiatric morbidity was 51%,the majority being depression (31%), followed by anxiety (17%), with psychosis being much less common, at only 3%. This finding of psychiatric morbidity in 51 % of the participants and depression in 31 % of our study population is similar to a study done by Kumar N[29] *et al* where 44% (67 of 152 subjects) of study population had psychiatric morbidity and 27% (41 subjects) had depression. Both Indian and Western literature report that the prevalence of postpartum depression ranges from 10% to 15%.[10] In one more study done by GK Poomalar *et al*[28], twenty-six women (10.6%) had postpartum depression among 254 women which is different from our study. The factors such as a woman's age, religion, her husband's age, the educational levels of both the woman and her husband, her occupation, socioeconomic status, and family income do not significantly affect the incidence of postpartum depression. In one more study done by Srivastava AS *et al*,[26] the results of which varied from our results with 16 out of 100 women (16%) developed psychiatric conditions, 12% experienced major depressive disorder, while 4% were diagnosed with anxiety disorder. There were no cases of postpartum or puerperal psychosis which is different when compared with our study where 3 % had psychosis. According to Wan *et al*,[31] the prevalence of postnatal depression was found to be 15.5%, while Ramchandani *et al*,[32] reported a rate of 16.4%. Additionally, Britton [33] observed that 24.9% of mothers experienced anxiety. In one more Indian study done by S Goyal [1] *et al*, 29 (10.3%) out of 289 women had psychiatric morbidity, of which 20 had major depression (7.12%), 4 had anxiety disorder (1.41%), 2 had brief psychotic disorder (0.71%), 1(0.36%) had bipolar disorder, 1(0.36%) had adjustment disorder and 1(0.36%) had obsessive compulsive disorder, these results varied when compared with our study.

CONCLUSION

The study reveals that psychiatric morbidity, particularly depression and anxiety, is prevalent among postpartum women, with depression affecting 31% and anxiety affecting 17% of participants. Psychosis was observed at a much lower rate (3%). Despite the majority of participants coming from rural areas, having lower educational attainment, and belonging to lower socio-economic backgrounds, no statistically significant association was found between socio-economic status, religion, or other socio-demographic factors and psychiatric morbidity. These findings suggest that while mental health challenges are common in the postpartum period, they are not strongly influenced by socio-demographic factors in this population. This underscores the need for broader mental health support irrespective of socio-economic and demographic backgrounds. A larger sample size with prospective assessment is needed to generalize the findings of this study.

Conflict of Interest: None

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