

A Study to Explore the Prevalence of Postpartum Depression Among Women in Rural and Urban Area of Bengaluru

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ABSTRACT

Background: Postpartum depression (PPD) is a significant maternal mental health issue, affecting an estimated 13–19% of mothers. It can impair a woman's ability to manage daily life, work effectively, and engage fully in her community.

Objectives: This study aimed to determine the prevalence of PPD among postnatal mothers, identify associated risk factors, compare prevalence between rural and urban areas, and evaluate the impact of awareness and counselling interventions.

Methods: A community-based cross-sectional study was conducted over six months in Bengaluru, Karnataka, involving 569 post-delivery women from primary health centres and Anganwadi centres in both rural and urban areas. Data were collected using a self-structured questionnaire covering socio-demographic, pregnancy, and delivery-related characteristics, along with the Edinburgh Postnatal Depression Scale (EPDS) to screen for PPD.

Results: The overall prevalence of PPD was 17.2% (98/569), with the majority of cases (95.9%) occurring among mothers aged 20-35 years. Significant associated factors included age at marriage, occupation, household wealth index, education, gender of child, family support, mode of breast feeding and pregnancy-related complications. Rural mothers had a slightly higher prevalence (54.1%) compared to urban mothers (45.9%). Awareness and understanding of PPD improved notably following counselling and distribution of Patient Information Leaflets (PIL).

Conclusion: PPD remains a notable public health concern in both rural and urban settings. Early detection, timely referral, and targeted interventions particularly those addressing identified risk factors and enhancing awareness can substantially improve maternal emotional well-being in the postpartum period.

keywords: Postpartum depression, Edinburgh Postnatal Depression Scale, Prevalence, Counselling, Emotional health,

1.INTRODUCTION

A baby's birth can cause a wide range of intense feelings, including joy and excitement, as well as dread and anxiety. However, it can also lead to unexpected depression. One major mental health barrier affecting women is postpartum depression (PPD), which affects between 13% and 19% of women who have just become mothers. PPD was originally described as a major depressive illness (MDD) that appears one month following childbirth. It is a more severe and persistent kind of despair. It can begin during pregnancy and persist after childbirth, which is why it is sometimes referred to as peripartum depression.

Postpartum depression in new moms is typified by a lingering low mood followed by feelings of hopelessness, worthlessness, and grief. It is not the same as baby blues, which are a transient period of emotional distress. PPD shares many features with depression such as irregular eating patterns, insomnia, and low energy. It is challenging to distinguish between symptoms of mental illness and those commonly experienced after childbirth and new baby care. About 30% of women may experience PPD for up to two years, and nearly 50% of women may experience major depression at some point during the postpartum phase.

This raises a serious risk to the health and well-being of the woman, the child, and society at large. Untreated PPD may result in long-term depression and create significant emotional, cognitive, and behavioural problems in children. It can reduce a mother's ability to bond with her child, which in turn affects the child's emotional growth. However, PPD remains underdiagnosed and undertreated, particularly in lower-income regions like rural India. While several treatments exist, less than 5% of women in many developing nations actually receive care. This highlights the need for better screening, awareness, and support strategies targeted at vulnerable postpartum women.

1.1. Postpartum Depression: A Growing Public Health Concern

PPD poses a growing public health issue globally. While developed nations have established support systems, awareness, and accessible interventions, developing countries are still lagging behind. Cultural taboos, gender bias, limited healthcare resources, and a lack of education about mental health contribute to this treatment gap. In India, the problem is even more pronounced due to social stigma, gender expectations, lack of spousal support, and financial stressors. These contribute significantly to maternal mental distress during and after childbirth is linked to various factors including hormonal changes, psychological stress, and social support systems. Women going through unplanned pregnancies, having a female baby in preference-sensitive families, or experiencing marital discord are at higher risk. Other common causes include prior history of depression, complications during pregnancy, and lack of postpartum

care. In India, many new mothers face a dual burden physical recovery and emotional trauma without any psychological guidance.

1.2. Rural vs. Urban Challenges

The rural-urban divide presents distinct challenges in addressing PPD. Urban mothers may have better access to hospitals and healthcare professionals, but they often face loneliness and nuclear family isolation. On the other hand, rural women may be surrounded by extended families but lack access to mental health services. Education level, cultural beliefs, distance from healthcare centres, and gender-based pressures affect how mothers in different communities perceive and manage their mental health.

This study aims to compare the prevalence of PPD in both settings to understand how demographic, social, and healthcare access variables influence the onset and management of the condition. It seeks to fill a critical gap in existing literature by not only quantifying the problem but also identifying solutions through education and intervention.

1.3. Awareness and Intervention: A Key Step Forward

While much of the research focuses on identifying risk factors and prevalence, fewer studies offer solutions to directly support affected women. In this study, an added component of intervention is included—creating awareness and offering Patient Information Leaflets (PILs) to participants. These PILs provide educational material in simple language to help mothers understand their mental health condition, recognize symptoms early, and seek appropriate help.

Counselling was also a part of the intervention for mothers who scored above the threshold on the Edinburgh Postnatal Depression Scale (EPDS). Counselling included emotional support, reassurance, and guidance on available resources. Early counselling combined with educational material is a low-cost, practical solution that can be implemented even in resource-constrained rural settings.

2.METHODOLOGY

2.1. Study design:

A community-based cross-sectional study

2.2. Study materials:

A Self-structured questionnaires and Edinburgh Postnatal Depression Scale (EPDS), validated leaflets, informed consent form.

2.3. Place of study:

Primary health centres and Anganwadi's of rural and urban area of Bengaluru.

2.4. Study Period:

The study was conducted over a period of six months

2.5. Study criteria:

2.5.1. Inclusion criteria:

- All the postpartum mothers who were present on the day of data collection and gave their consent to participate were included in this study.

2.5.2. Exclusion criteria:

- Postpartum mothers who were not willing to participate were excluded from the study.
- Women who are having mental illness were excluded from the study

2.6. Sample size calculation:

The sample size is calculated by using the equation

$$n = 4pq / d^2$$

n = sample size

p = expected proportion of subjects with the character

q = p-100

d = precision for the study q = 100-p (100-21.5) = 78.5

$n = \{(4 \times 21.5 \times 78.5) \div (5)^2\} = 270$

The sample size for study is 270.

Not less than 270 subjects, with precision of 5%.

2.7. Ethical Approval:

Ethical committee clearance has been obtained by the Institutional Ethical Committee (IEC) of East West College of Pharmacy, Bengaluru.

2.8. Study Procedure

Population based interventional study in rural and urban was conducted for 6 months served by Primary Health Care Centre and Anganwadi's Bengaluru. All post-delivery women were

included in the study. A self-structured questionnaire was used. In the first section, questions about socio-demographic, pregnancy and delivery related characteristics of the sample including age, educational level, occupational status, wealth index and pregnancy and delivery related inquiries which include age of marriage, age of last pregnancy, type and size of family, number and sex of children, one statement concerning the mode of breast feeding, existence of any comorbidities related to pregnancy. Participants provided with the Kannada and English version of the Edinburgh Postnatal Depression Scale (EPDS). EPDS has been chosen as it has been developed in screening postpartum depression and has been widely used for that purpose in numerous other studies. EPDS consists of 10 points with a four-item scale, with maximum scores of 30. The Kannada and English version of the EPDS was found to be a valid and reliable instrument with an internal consistency. Therefore, a total score of 12 or greater has been recommend as an indicator of possible depression demographic, social and health related characters. Next, educational resources were used to raise awareness of postpartum depression, and the EPD scale was examined to determine the status of postpartum depression. Identified depressed cases mothers, was provided counselling to each individual postpartum mothers, which helps to improve the quality of life among the depressed mothers.

2.9. Statistical methods:

The methodology employed in this study involved in using various statistical tools to analyse and interpret the data. Data frequency and percentage tables were employed to provide a descriptive overview. For univariate presentation, simple column charts were utilized, while multivariate presentations utilized cluster column charts. To assess the significance the chi-square test was applied. Throughout these analyses, p value of less than 0.05 was considered as statistically significant.

2.10. Statistical software:

Microsoft Excel was used to compile the data and SPSS version 27 was used to analyse the data.

3.RESULTS

The study was conducted on postpartum mothers in government hospitals' immunization departments and Anganwadi centres in Bengaluru, Karnataka, both in rural areas and urban areas, with permission. 569 women in all took part in the study, and 100% of them responded.

Characteristics	Category	Frequency n=569	Percentage (%)
Age of the mother	< 20 years	19	3.3
	20 – 35 years	545	95.8
	≥ 36 years	5	0.9
Education of the mother	Primary school	22	4
	Middle school	60	11
	High school	156	27
	Graduate	313	55
	Illiterate	18	3
Occupation of the mother	House maker	454	80
	Working	115	20
Household wealth index of family per month	≤ Rs. 12444	59	10.4
	Rs.12445 – 37324	31	5.4
	Rs. 37325 – 62272	48	8.4
	Rs. 62273 – 93380	112	19.7
	Rs. 92381 - 124488	66	11.6
	Rs. 124489 –249043	84	14.8
	≥ Rs. 249044	169	29.7
Socio economic status	Lower	11	2
	Lower middle	137	24
	Upper lower	104	18
	Upper middle	275	48
	Upper class	42	8

Table.3.1. Association of demographic characteristics with postpartum depression:

The demographic analysis reveals a relatively homogeneous population (N=569) with respect to age (95.8% between 20-35 years) and education (55 % holding graduate degrees). Occupational distribution indicates a predominance of housemakers (80 %). Socioeconomic status varies, with 48 % classified as upper-middle class, while household wealth indices demonstrate a skewed distribution toward higher income level.

Characteristics	Category	Frequency n=569	Percentage (%)
Age at last pregnancy	18-20 years	41	7.2
	20 – 35 years	524	92.1
	>35years	4	0.7
Age at marriage	16-20 years	241	42.4
	21-25 years	249	43.8
	26-35 years	79	13.8
Number of child birth	One	294	51
	Two	236	42
	Three	39	7
Gender of new born	Male	263	46
	Female	306	54
Type of pregnancy	Planned pregnancy	205	36
	Unplanned pregnancy	364	64
Family support	Having any kind of support	249	43.7
	Not having support	320	56.3
Pregnancy related problems	No	440	77
	Yes	129	23
Type of delivery	Cesarean section	258	45
	Normal vaginal	311	55
Type of family	Joint	307	54
	Nuclear	262	46
Size of the family	1 to 5	322	56
	6 to 10	226	40
	More than 10	21	4
Mode of breastfeeding	Combination of breastfeeding and formula feeding	93	16
	Consulting a lactation specialist for guidance	5	1
	Exclusive breastfeeding with emotional support	456	80
	Pumping breast milk for bottle feeding	15	3

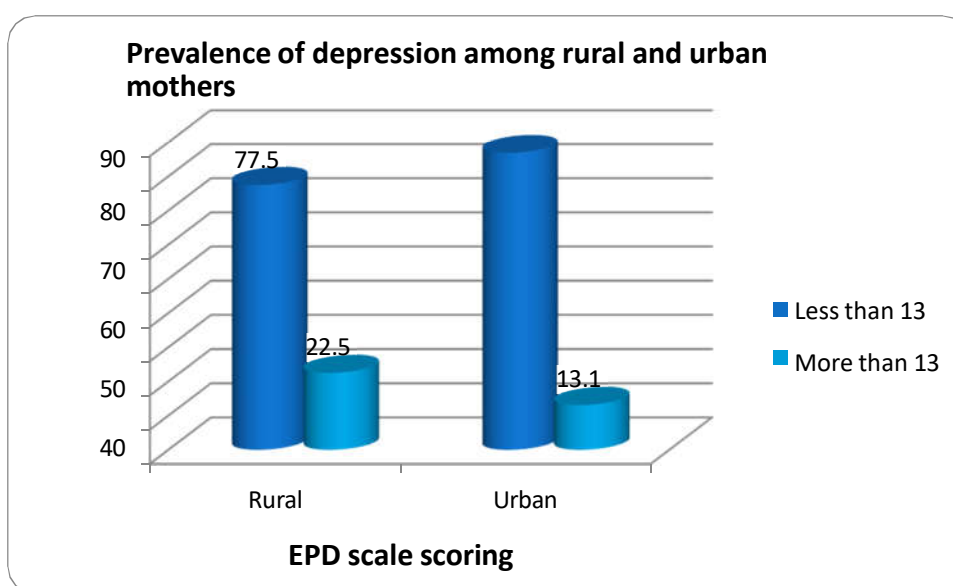
Table.3.2. Association between pregnancy and delivery related characteristics with postpartum depression:

The table compiles the sociodemographic and obstetric details of 569 postpartum mothers. Most women (92.1%) were between the ages of 21 and 35, while 86.2% were married between the ages of 16 and 25. 64% had unintended pregnancies, and 51% were first-time mothers. The majority (77%) reported no pregnancy-related issues, and 55% gave birth vaginally. Moderate

family sizes were prevalent, as were joint family configurations (54%). With emotional support, exclusive breastfeeding was the most common feeding technique (80%).

Figure.3.3. Prevalence of Postpartum Depression (PPD) among Mothers by EPDS Score and Area of Residence

EPDS Score	Total (<i>N</i> = 569)	Rural (<i>N</i> = 249)	Urban (<i>N</i> = 320)
≤ 13	471 (82.8%)	193 (77.5%)	278 (86.9%)
More than 13	98 (17.2%)	56 (22.5%)	42 (13.1%)



Postpartum depression was more prevalent among rural mothers (22.5%) than urban mothers (13.1%) based on EPDS scores ≥ 13 . A greater proportion of urban mothers (86.9%) scored below the threshold compared to rural mothers (77.5%).

Characteristic	Category	Total (N=98)	Rural (N=56)	Urban (N=42)
Age of the mother	< 20 years	4 (4.1%)	14(25%)	8(19%)
	20 – 35 years	94 (95.9%)	26(46.6%)	20(47.6%)
	≥ 36 years	0 (0%)	16 (28.6%)	14(33.4%)
Education of the mother	Illiterate	9 (9%)	8 (14%)	1(2%)
	Primary school	5 (5%)	4(7%)	1(2%)
	Middle school	8 (8%)	5(19%)	3(7%)
	High school	12 (12%)	10(18%)	2(5%)
	Graduate	64 (66%)	29(52%)	35(84%)
Occupation of the mother	Housemaker	53 (54%)	40(71%)	13(31%)
	Working	45 (46%)	16(29%)	29(69%)
Household Wealth Index (₹/month)	≤ ₹12,444	6 (6.1%)	2(3.6%)	4(9.5%)
	₹12,445 – 37,324	4 (4.1%)	35(5.4%)	1(2.4%)
	₹37,325 – 62,272	7 (7.1%)	3(5.4%)	4(9.5%)
	₹62,273 – 93,380	23 (23.5%)	16(28.6%)	7(16.7%)
	₹93,381 – 124,488	18 (18.4%)	9(16.1%)	9(21.4%)
	₹124,489 – 249,043	14 (14.3%)	6(10.7%)	6(19%)
	≥ ₹249,044	26 (26.5%)	17(30.4%)	9(21.4%)
Socio-economic Status	Lower	2 (2%)	8 (14.3%)	6(14.3%)
	Lower middle	25 (26%)	10 (17.9%)	8(19%)
	Upper lower	18 (18%)	15(26.8%)	12(28.6%)
	Upper middle	41 (42%)	13(23.2%)	9(21.4%)
	Upper class	12 (12%)	10(17.8%)	7(16.7%)

Table.3.4. Association of Socio-demographic characteristics with depressed mothers in rural and urban area

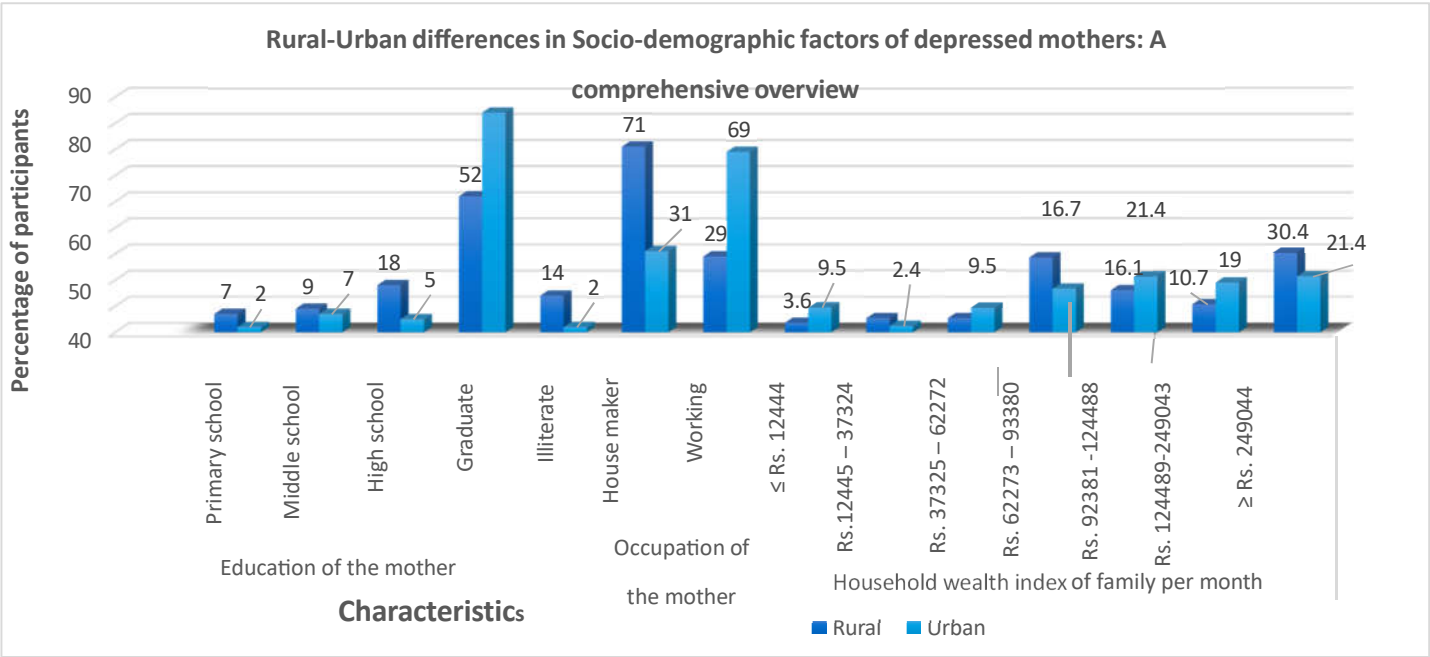
The table compares demographic characteristics of mothers in rural and urban areas, showing urban mothers have higher education levels and household incomes. Rural mothers are more likely to be homemakers and have lower incomes. Urban areas have a higher percentage of working mothers. The data highlights socio-economic differences between rural and urban mothers.

Table.3.4.1. Relationship between Residence and Socio-Demographic Factors among Mothers

Characteristics	Chi-square value	Df value	P value	Significance
Education of the mothers	χ^2 value=11.882	Df=1	0.0012	Sig
Occupation of the mother	χ^2 value=14.245	Df=1	0.0001	Sig
Household wealth index of family Per month	χ^2 value=16.205	Df=1	0.0016	Sig

The chi-square test results show a significant association between residence and mothers' education and occupation, which may impact postpartum depression risk. Socio-demographic factors like education, occupation and Household income can influence mental health outcomes during the postpartum period.

Figure.3.4.2: Rural-Urban differences in Socio-demographic factors of depressed mothers: A comprehensive overview



Urban mothers are more educated, with 84% graduates, compared to 52% in rural areas. Rural mothers are mostly homemakers (71%), while urban mothers are

Characteristics	Category	Total (N=98)	Rural (N=56)	Urban (N=42)
Age at last pregnancy	18–20 years	9 (9.2%)	7 (12.5%)	2 (4.8%)
	20–35 years	87 (88.8%)	47 (83.9%)	40 (95.2%)
	>35 years	2 (2.0%)	2 (3.6%)	0 (0%)
Age at marriage	16-20 years	45 (45.9%)	25 (45%)	20 (47.5%)
	21-25 years	33 (33.7%)	19 (33.9%)	14(33.3%)
	26-35 years	20 (20.4%)	12 (21.4%)	8 (19 %)
Number of child birth	One	48 (49.0%)	23 (41.1%)	25 (59.5%)
	Two	39 (39.8%)	25 (44.6%)	14 (33.3%)
	Three	11 (11.2%)	8 (14.3%)	3 (7.1%)
Gender of new born	Male	37 (38%)	14 (25%)	23 (55%)
	Female	61 (62%)	42 (75%)	19(45%)
Type of pregnancy	Planned Pregnancy	25 (25.5%)	11 (19.6%)	14 (33.3%)
	Unplanned Pregnancy	73 (74.5%)	45 (80.4%)	28 (66.7%)
Family support	Having any kind of support	41 (41.8%)	15 (27%)	26(62%)
	Not having support	57 (58.2%)	41 (73%)	16 (38%)
Pregnancy related problems	No	63 (64%)	30 (54%)	33 (79%)
	Yes	35 (36%)	26 (46%)	9 (21%)
Type of delivery	Cesarean Section	50 (51.0%)	26 (46.4%)	24 (57.1%)
	Normal Vaginal Delivery	48 (49.0%)	30 (53.6%)	18 (42.9%)
Type of family	Joint	48 (49.0%)	34 (60.7%)	14 (33.3%)
	Nuclear	50 (51.0%)	22 (39.3%)	28 (66.7%)
Size of the family	1 to 5	53 (54.1%)	29 (51.8%)	24 (57.1%)
	6 to 10	39 (39.8%)	22 (39.3%)	17 (40.5%)
	More than 10	6 (6.1%)	5 (8.9%)	1 (2.4%)
Mode of breastfeeding	Exclusive breastfeeding with emotional support	66 (67%)	38 (68%)	28 (67%)
	Combination of breastfeeding and formula feeding	24 (25%)	13 (23%)	11 (26%)
	Pumping breast milk for bottle feeding	6 (6%)	3 (5%)	3 (7%)
	Consulting a lactation specialist for guidance	2 (2%)	2 (4%)	0

more likely to work (69%). Household wealth shows a similar distribution in both areas, with rural areas slightly inclining towards higher income.

Table.3.5. Association between pregnancy and delivery related characteristics with depressed mothers

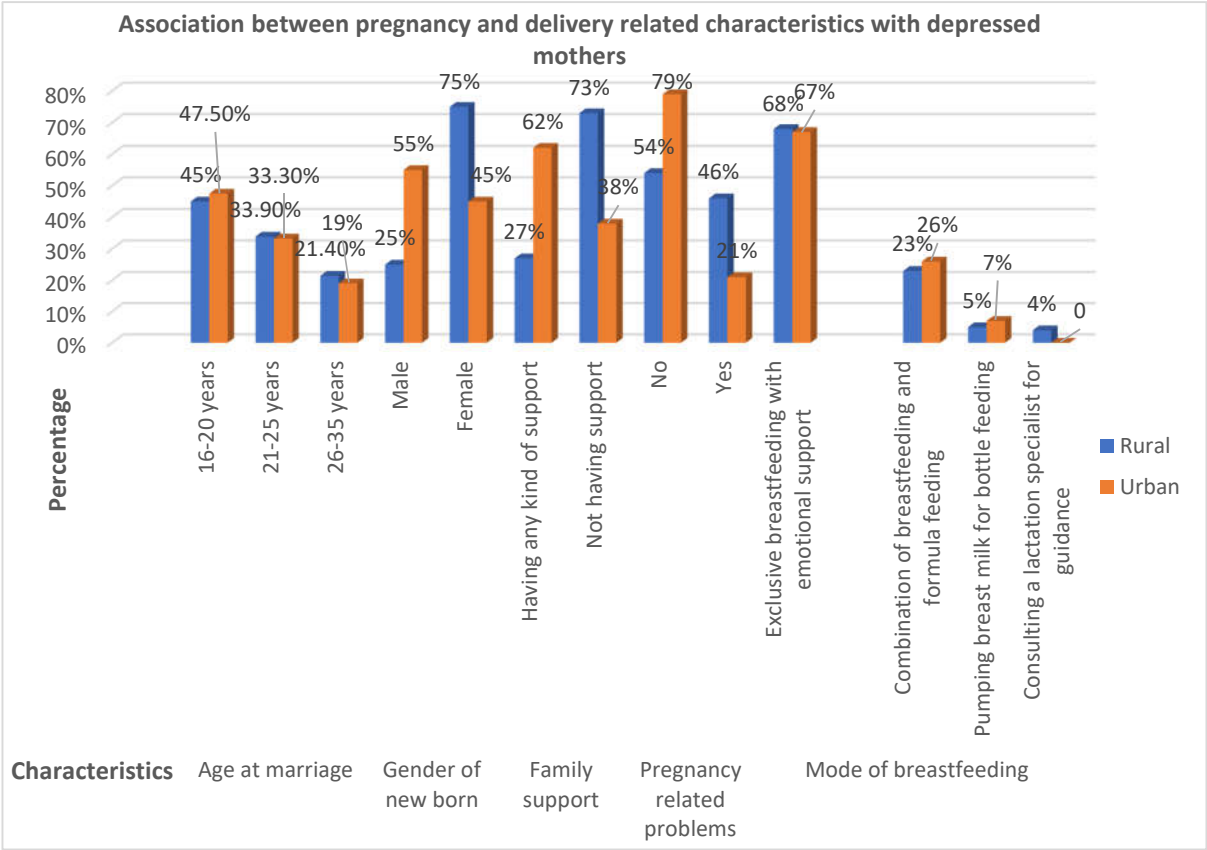
The table summarizes key socio-demographic characteristics of 98 mothers with postpartum depression, comparing rural (n=56) and urban (n=42) populations. Most mothers were aged 20–35 years, with early marriage (16–20 years) being common in both groups. Unplanned pregnancies, lack of family support, and pregnancy-related problems were more frequent in rural areas. Caesarean deliveries were more common in urban mothers, while joint families and larger family sizes were more prevalent in rural settings. Exclusive breastfeeding with emotional support was similar across both groups.

Table.3.5.1. Relationship between Residence and Socio-Demographic Factors among Mothers

Characteristics	Chi-square value	Df value	P value	Significance
Age at marriage	χ^2 value=9.516	Df=2	0.009	Sig
Gender of new born	χ^2 value=9.0459	Df=2	0.012	Sig
Family support	χ^2 value=10.764	Df=2	0.0001	Sig
Pregnancy related problems	χ^2 value=6.533	Df=1	0.011	Sig
Mode of breastfeeding	χ^2 value=10.828	Df=1	0.001	Sig

The table shows significant associations between postpartum depression and factors such as age at marriage, gender of the newborn, family support, pregnancy-related problems, and mode of breastfeeding ($p < 0.05$). These results suggest that both social and biological factors may contribute to the risk of postpartum depression among mothers.

Figure.3.5.2. Association between pregnancy and delivery related characteristics with depressed mothers



The graph shows that postpartum depression is more prevalent among mothers with early marriage, lack of family support, pregnancy complications, and female newborns, especially in rural areas. Emotional support and exclusive breastfeeding are linked to lower depression rates in both rural and urban mothers.

4.Conclusion

The study titled "A Study to Explore the Prevalence of Postpartum Depression among Women in Rural and Urban Areas of Bengaluru" concludes that the potential effects of postpartum depression on the lives of mothers, children, and families make it a serious concern. The research identified 17.2% of participants had probable depression based on the Edinburgh Postnatal Depression Scale (EPDS). Unplanned pregnancies, a lack of family support,

pregnancy comorbidities, the mode of breast feeding, the mother's education, the occupation of the mother, the household wealth index and the mother's age at marriage are risk factors that were common among depressive mothers. The significant frequency of postpartum depression (PPD), especially in rural regions, is highlighted by the study. In order to address mental health issues among new mothers, it highlights the necessity of early detection and community-based interventions. Additionally, it demands more healthcare interventions as well as emotional support. The study suggests that routine postpartum PPD screening be done, along with targeted mental health support, family support strengthening, increased access to healthcare resources, and prompt medical and psychological aid. PPD awareness can also be raised through public health campaigns.

The study emphasizes the significance of patient education through thoughtfully designed Patient Information Leaflets (PILs), which were assessed using a variety of readability and content assessment instruments, including the Flesch-Kincaid Grade Level (FK-GL), Flesch Reading Ease (FRE), and Content Validity Index (CVI). The findings showed that postpartum women could easily understand and utilize the PILs to effectively communicate important health information.

Therefore, the study recommends PPD will be effectively controlled by a collaborative-care strategy comprising social workers, obstetricians, psychiatrists, and community health professionals who treat the mostly controllable risk factors. Prior to conception, family counselling should be considered for the purpose of gender equality and the resolution of marital and familial conflicts. The adoption of integrated care pathways within maternity and child health programs to identify, assist, and manage women who are at risk will significantly enhance the well-being of mothers, the mother-infant bond, and the growth and development of children.

5.Conflict of interest statement

All authors contributed positively to the writing of this manuscript, and there is no conflict of interest as agreed upon in the content of this research.

6.Statement of ethical approval

Ethical committee clearance has been obtained by the Institutional Ethical Committee (IEC) of East West College of Pharmacy, Bengaluru.

7.Statement of informed consent

The informed consent was obtained from all individual participants included in the study.

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