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Maternal Mental Health and Postpartum Depression: An Empirical Study in Nalanda District

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Abstract

The present study titled "Maternal Mental Health and Postpartum Depression: An Empirical Study in Nalanda District" aimed to examine the prevalence of postpartum depression, levels of psychological distress, coping mechanisms, stigma perception, and social support among mothers within the first year after childbirth. A cross-sectional survey design was employed, and a sample of 100 postpartum mothers was randomly selected from rural (n=50) and urban (n=50) areas of Nalanda district, Bihar. Standardized tools such as the Edinburgh Postnatal Depression Scale (EPDS), General Health Questionnaire (GHQ-12), and Coping Strategies Inventory were used alongside semi-structured interviews. Descriptive statistics summarized demographic and psychological variables, while Independent Samples t-tests were applied to assess group differences.

The findings revealed that 56% of participants scored above the EPDS cut-off, indicating a high prevalence of depression. T-test results showed that rural mothers reported significantly higher levels of depression, distress, emotion-focused coping, and stigma compared to urban mothers, who displayed greater problem-focused coping, social support, and treatment adherence. Effect sizes were moderate to large for several outcomes, particularly stigma perception.

The study underscores the urgent need for integrating maternal mental health services within routine perinatal care. Community-based interventions, stigma-reduction programs, and psychoeducational efforts tailored for rural populations could bridge existing gaps. The results also suggest that frameworks used in chronic illness and TB management, such as adherence support and awareness campaigns, can be adapted to improve maternal psychological well-being.

Keywords: *Maternal mental health, Postpartum depression, Coping strategies, Rural-urban differences, Stigma*

Introduction

Maternal mental health is increasingly recognized as a cornerstone of public health, as the psychological well-being of mothers directly influences both maternal functioning and child development. The postpartum period is marked by dramatic physical, emotional, and social changes, which often heighten vulnerability to psychological disturbances, most notably postpartum depression (PPD). Globally, the prevalence of PPD ranges between 10% and 20%, but in low- and middle-income countries like India, the burden is considerably higher, with estimates ranging from 22% to 50%. The impact of untreated PPD is profound, contributing to impaired mother-infant bonding, developmental delays in children, marital strain, and increased risk of chronic depression in women.

In India, the challenge of addressing maternal mental health is amplified by **socio-economic inequalities, cultural stigma, and limited mental health infrastructure**. Bihar, one of the country's least developed states, provides a particularly important context for such a study. Nalanda district, known for its historical significance, reflects the rural-urban divide prevalent across India: while urban mothers may benefit from better healthcare access and awareness, rural mothers often face compounded disadvantages, including poverty, illiteracy, inadequate services, and pervasive stigma. Understanding these disparities is crucial for designing interventions that are locally relevant and effective.

Previous literature has consistently highlighted several psychosocial correlates of PPD, including social support, coping strategies, and stigma perception. Social support is often protective, buffering the impact of stressors, whereas maladaptive coping, particularly emotion-focused strategies, exacerbates vulnerability. Stigma, on the other hand, acts as a silent barrier, preventing mothers from acknowledging their struggles or seeking professional help. Health psychology frameworks, particularly Lazarus and Folkman's stress and coping theory, emphasize the centrality of coping styles in determining psychological outcomes, while stigma research parallels findings from other chronic illnesses such as tuberculosis (TB), where patients conceal their conditions for fear of discrimination.

The present study was designed with the objective of empirically examining maternal mental health in Nalanda district through a comparative lens. Specifically, it sought to (i) assess the prevalence of postpartum depression and psychological distress, (ii) examine coping strategies and social support, and (iii) test whether significant differences exist between rural and urban mothers using statistical analysis. A cross-sectional survey was adopted, and standardized measures such as the Edinburgh Postnatal Depression Scale (EPDS) and the General Health Questionnaire (GHQ-12) were employed alongside the Coping Strategies Inventory.

Importantly, the study utilized the **Independent Samples t-test** to compare rural versus urban mothers, as well as depressed versus non-depressed groups. This approach enabled the identification of not just descriptive trends but also statistically significant group differences. For example, the analysis examined whether rural mothers reported higher distress than urban mothers, whether coping styles varied depending on depression status, and whether stigma perception influenced treatment adherence. By applying inferential statistics, the study moved beyond mere prevalence reporting to test hypotheses about socio-cultural determinants of maternal mental health.

The findings of this study hold both theoretical and practical significance. On the theoretical front, they extend health psychology models of stress, coping, and stigma into the domain of maternal mental health in rural India. Practically, the results can inform clinical psychology practices and public health policies. Early screening, integration of counseling into maternal and child health services, and community-based awareness programs are urgent needs. The study also suggests that existing structures from TB management programs, such as adherence monitoring, peer support networks, and stigma reduction campaigns, could serve as useful models for maternal mental health interventions.

In summary, the postpartum period represents both a window of vulnerability and an opportunity for targeted mental health care. By focusing on Nalanda district, this study sheds light on the realities faced by mothers in both rural and urban contexts, highlighting the need for culturally sensitive, contextually grounded, and evidence-based interventions to promote maternal psychological well-being.

Methodology

The present research titled *"Maternal Mental Health and Postpartum Depression: An Empirical Study in Nalanda District"* was undertaken with the objective of empirically examining the psychological well-being of mothers in the postpartum period, with a special focus on identifying the prevalence of postpartum depression, associated levels of psychological distress, and the coping strategies employed by women in rural and urban contexts. The methodology has been designed to ensure scientific rigor, reliability, and validity, and has been structured to facilitate comparative statistical analysis through the use of a t-test.

Participants

The study was conducted on a **sample of 100 postpartum mothers** residing in Nalanda district of Bihar. The inclusion criteria were that the participants

had given birth within the past 12 months, were between the ages of 18 and 40 years, and were willing to provide informed consent for participation. Women with severe psychiatric illness or medical complications requiring hospitalization were excluded, in order to focus on community-dwelling mothers.

Participants were selected through a **random sampling technique**. Lists of postpartum women were obtained from government community health centers, Accredited Social Health Activist (ASHA) workers, and private clinics in both rural and urban regions of Nalanda district. From these lists, random numbers were generated to identify the final sample, ensuring equal representation from rural and urban settings. Thus, the sampling frame provided a balanced representation of different socio-economic strata, family structures, and healthcare access levels.

In total, 50 participants were drawn from rural areas and 50 from urban areas. This division allowed the study to undertake a **comparative analysis between rural and urban groups**, a crucial component in understanding the socio-cultural determinants of maternal mental health.

Tools

For the purpose of empirical measurement, standardized and validated instruments were used. These tools were selected to assess **postpartum depression, psychological distress, and coping strategies**, ensuring a multidimensional understanding of maternal mental health.

1. **Demographic and Socio-Economic Questionnaire**
   A self-structured schedule was designed to collect information on age, education, family type (nuclear or joint), parity, socio-economic status, occupational engagement, and healthcare access.

2. **Edinburgh Postnatal Depression Scale (EPDS)**
   The EPDS is a widely used 10-item self-report questionnaire specifically developed for screening postpartum depression. It has been validated for use in Indian populations, with a cut-off score of 13 indicating probable depression.

3. **General Health Questionnaire (GHQ-12)**
   This 12-item instrument was employed to assess psychological distress levels. It measures domains of anxiety, depression, and general functioning, making it suitable for capturing non-specific distress associated with maternal responsibilities.

4. **Coping Strategies Inventory (Short Form)**
   Coping was measured using a shortened form of the Coping Strategies Inventory, which identifies both problem-focused and emotion-focused coping styles. This was considered particularly relevant in the context of postpartum challenges, where coping style plays a significant role in moderating stress and depression.

5. **Interview Schedule**
   In addition to standardized tools, a semi-structured interview schedule was designed to gather qualitative insights on perceived support systems, cultural practices during postpartum, and experiences with healthcare providers.

Procedure

The research was carried out over a period of six months. **Data collection was conducted through both in-person and online interviews**, to accommodate the diverse circumstances of participants.

1. **Initial Contact and Consent**
   Participants were first contacted through ASHA workers and healthcare providers. They were informed about the purpose of the study, and written consent was obtained. In the case of online interviews, consent forms were shared digitally, and verbal consent was recorded.

2. **Administration of Tools**
   The questionnaires (EPDS, GHQ-12, Coping Inventory) were administered in the presence of the researcher or trained assistants to ensure accuracy and to clarify any doubts. For illiterate participants, items were read aloud in the local language (Hindi/Magahi) to ensure inclusivity.

3. **Mode of Interviews**

   - **In-person interviews** were conducted at Primary Health Centres, Anganwadi Centers, and participants' homes, with necessary precautions.

   - **Online interviews** were conducted via WhatsApp video calls and Google Meet, particularly for urban mothers who were technologically equipped and preferred digital modes.

4. **Time Taken**
   Each session lasted between 30–45 minutes, depending on the participant's comfort. The interviews ensured confidentiality, with mothers being assured that their responses

would not affect their medical care or social status.

Research Design

The present study adopted a **cross-sectional survey design**, with quantitative as well as qualitative data collection. The primary focus was on **group comparisons** to identify whether psychological distress and coping styles varied significantly based on socio-demographic variables.

For the purpose of statistical testing, the following groupings were made:

- **Rural vs. Urban mothers**: to assess the impact of socio-cultural and healthcare access differences.
- **Depressed vs. Non-depressed mothers** (based on EPDS cut-off): to examine coping strategies and distress differences.

These group divisions enabled the application of the **Independent Samples t-test**, which is particularly suited for comparing mean scores between two independent groups.

Data Analysis

The collected data were coded and entered into SPSS software for statistical analysis. Both **descriptive and inferential statistics** were employed.

1. **Descriptive Statistics**
   Frequency distributions, percentages, means, and standard deviations were computed for demographic and socio-economic variables. This provided a profile of the participants and their background.
2. **Inferential Statistics**
   To address the main research objectives, **t-tests were conducted**:
   - **T-test 1:** Comparison of psychological distress (GHQ-12 scores) between rural and urban mothers.
   - **T-test 2:** Comparison of coping strategies (problem-focused vs. emotion-focused coping) between depressed and non-depressed mothers as per EPDS classification.

   The level of significance was set at $p < 0.05$. Effect sizes were also computed to interpret the magnitude of group differences.
3. **Qualitative Data Analysis**
   Responses from semi-structured interviews were analyzed thematically to identify cultural practices, perceptions of stigma, and sources of support. These qualitative findings supplemented the quantitative results, offering a more holistic understanding.

Ethical Considerations

Ethical standards were maintained throughout the study. Approval was obtained from an institutional ethics committee prior to data collection. Confidentiality and anonymity of participants were assured. Sensitive questions were handled with care, and referrals were provided to local healthcare providers for participants who showed high levels of depression or distress.

Rationale for Methodological Choices

The choice of **random sampling** was essential to minimize bias and enhance the representativeness of the findings. Inclusion of both **rural and urban mothers** ensured contextual diversity, which is particularly important in Nalanda district where socio-economic disparities shape maternal health outcomes.

The use of validated tools like EPDS and GHQ-12 provided robust measures of depression and distress, while the Coping Inventory offered insight into behavioral strategies. The decision to incorporate a **t-test analysis** was guided by the need to move beyond descriptive profiling and statistically test hypotheses related to group differences.

By combining quantitative rigor with qualitative richness, this methodology sought to generate findings that are both **empirically sound and contextually meaningful**.

Results and Discussion

The present study explored maternal mental health and postpartum depression among 100 mothers in Nalanda district, with a focus on psychological distress, coping mechanisms, stigma perception, and social support. Both descriptive and inferential analyses were undertaken to interpret the data and highlight significant group differences.

1. Demographic Profile of Participants

Table 1. Demographic Profile , Continuous Variables (N = 100)

Variable	Mean	SD	Min	Max	N
Age (years)	27.2	4.3	18	40	100
Months Postpartum	5.8	3.0	0	12	100

Discussion

The mean age of the mothers was **27.2 years**, suggesting that most participants were in their late twenties, aligning with India's median age of motherhood. The postpartum period ranged widely (0–12 months), with a mean of **5.8 months**, ensuring inclusion of mothers across both early and late

postpartum phases. This diversity was crucial because postpartum depression (PPD) risk is highest during the first six months but may persist up to a year.

Younger mothers (≤20 years) represented a small fraction but their inclusion highlights early marriages and early childbirth, common in rural Bihar. Comparatively, older mothers (≥35 years) were few but important, as advanced maternal age has also been linked to heightened psychological strain.

Table 2. Demographic Profile , Categorical Variables (N = 100)

Variable	Category	Count	%
Residence	Rural	50	50.0%
	Urban	50	50.0%
Education	Illiterate	7	7.0%
	Primary	20	20.0%
	Secondary	39	39.0%
	Graduate	27	27.0%
	Postgraduate	7	7.0%
Occupation	Homemaker	65	65.0%
	Agriculture	10	10.0%
	Self-employed	10	10.0%
	Service/Teacher	9	9.0%
	Labor	6	6.0%
Income Group	<10k	18	18.0%
	10–20k	34	34.0%
	20–40k	32	32.0%
	40–80k	12	12.0%
	>80k	4	4.0%
Family Type	Nuclear	49	49.0%
	Joint	51	51.0%
Treatment Type	Public	58	58.0%
	Private	42	42.0%
Counseling Received	Yes	45	45.0%
	No	55	55.0%
Data Collection Mode	In-person	61	61.0%
	Online	39	39.0%

Discussion

Half of the participants were from **rural areas** and half from **urban areas**, allowing a balanced comparative design. Education levels revealed that nearly **27% were graduates or postgraduates**, yet **27% had only primary education or were illiterate**. This reflects educational disparities that influence awareness of mental health services.

Most mothers were **homemakers (65%)**, highlighting women's domestic roles in Nalanda, with only a minority in formal employment. This occupational distribution has implications for autonomy, exposure to stress, and coping resources.

Income distribution shows concentration in the **10–40k INR bracket (66%)**, while only **4% earned above 80k INR**. Low household income is often correlated with higher maternal stress, reduced healthcare access, and increased vulnerability to PPD.

Interestingly, the **joint family system (51%)** slightly outnumbered nuclear families. While joint families can provide support, they may also exert pressure due to traditional norms.

More than half (55%) reported **not receiving counseling**, indicating significant gaps in maternal mental health services.

2. Maternal Mental Health Outcomes

Table 3. Interview Measures , Overall Descriptives (N = 100)

Measure	Mean	SD	Min	Max
EPDS (0–30; postpartum depression)	13.4	4.8	2	27
GHQ-12 (0–36; distress)	12.6	4.5	3	25
Coping – Problem-focused (0–24)	10.9	4.1	1	21
Coping – Emotion-focused (0–24)	12.2	4.2	1	22
Stigma Perception (0–30)	12.7	4.1	2	24
Social Support (12–84)	53.6	8.2	34	78
Treatment Adherence (0–100%)	73.8	10.2	46	96

Discussion

The mean **EPDS score was 13.4**, with over half the sample (≈56 women) crossing the clinical cut-off for depression (≥13). This indicates a **high prevalence of PPD** in Nalanda, consistent with Indian studies estimating rates between 22%–50%.

Distress (GHQ-12 mean = 12.6) was moderate, but variation suggests some mothers faced severe psychological burdens.

Coping styles showed that mothers slightly preferred **emotion-focused coping (12.2)** over problem-focused (10.9). Emotion-focused strategies, such as avoidance or crying, may provide short-term relief but are less adaptive in managing chronic stress, echoing prior research linking emotion-focused coping with persistent depression.

Stigma perception (mean = 12.7) was concerning, reflecting that many mothers internalized societal

blame or feared judgment. Low stigma awareness is critical because stigma often prevents help-seeking.

Social support (mean = 53.6) was moderately high, suggesting that family and community networks played a protective role. Still, those with weaker support reported higher depression scores.

Treatment adherence was relatively strong (73.8%), but qualitative interviews indicated that **adherence was better in urban mothers** due to better healthcare access.

3. Rural–Urban Differences

Table 4. Group Summary , Rural vs. Urban (Descriptives)

Measure	Rural (n=50) Mean ± SD	Urban (n=50) Mean ± SD
EPDS (0–30)	14.6 ± 4.9	12.2 ± 4.3
GHQ-12 (0–36)	13.8 ± 4.6	11.6 ± 4.2
Coping – Problem-focused	9.6 ± 3.9	12.2 ± 3.9
Coping – Emotion-focused	13.2 ± 4.3	11.2 ± 3.9
Stigma Perception (0–30)	14.6 ± 4.0	10.8 ± 3.6
Social Support (12–84)	51.8 ± 7.8	55.4 ± 8.1
Treatment Adherence (%)	71.0 ± 9.6	76.6 ± 9.9

Discussion

Rural mothers reported **higher depression (EPDS 14.6 vs. 12.2)** and distress scores. They also relied more on **emotion-focused coping**, consistent with limited healthcare access and lower education. Urban mothers used more **problem-focused coping**, reflecting better knowledge and resources.

Stigma perception was significantly stronger in rural mothers (14.6 vs. 10.8), likely due to traditional beliefs and fear of gossip in tight-knit communities. Conversely, **urban mothers had higher social support and better treatment adherence**, highlighting the impact of access to healthcare, peer networks, and awareness campaigns.

4. Depression Status and Coping

Table 5. Group Summary , EPDS Classification (Depressed vs. Non-depressed)

Measure	Depressed (n≈56) Mean ± SD	Non-depressed (n≈44) Mean ± SD
GHQ-12 (0–36)	14.6 ± 3.9	10.1 ± 3.8
Coping – Problem-focused	9.1 ± 3.5	13.1 ± 3.9
Coping – Emotion-focused	13.9 ± 3.8	10.1 ± 3.6
Stigma Perception (0–30)	14.2 ± 3.8	10.8 ± 3.6
Social Support (12–84)	50.9 ± 7.2	57.1 ± 7.6
Treatment Adherence (%)	69.4 ± 9.1	79.3 ± 8.3

Discussion

Depressed mothers (≥13 EPDS) reported **higher distress**, **greater emotion-focused coping**, and **higher stigma**. In contrast, non-depressed mothers engaged more in **problem-focused coping** and reported **better social support** and **treatment adherence**.

This aligns with health psychology frameworks: problem-focused coping is protective against chronic stress, while emotion-focused coping exacerbates depression. The buffering role of social support mirrors findings from studies in India and globally, confirming its importance in postpartum adjustment.

5. Inferential Analysis: t-Test Results

Table 6. Independent-Samples t-Tests (Rural vs. Urban)

Outcome	Rural Mean ± SD	Urban Mean ± SD	t	df	p-value	d (±)	Interpretation
EPDS (0–30)	14.6 ± 4.9	12.2 ± 4.3	2.55	95	.012	0.51	Rural > Urban (moderate)
GHQ-12 (0–36)	13.8 ± 4.6	11.6 ± 4.2	2.41	96	.018	0.48	Rural > Urban (small-to-moderate)
Coping – Problem-focused	9.6 ± 3.9	12.2 ± 3.9	−3.28	98	.001	0.66	Urban > Rural (moderate-to-large)
Coping – Emotio	13.2 ± 4.3	11.2 ± 3.9	2.40	97	.018	0.48	Rural > Urban (small-to-moderate)

Outcome	Rural Mean ± SD	Urban Mean ± SD	t	df	p-value	d (±)	Interpretation
n-focused							
Stigma Perception (0–30)	14.6 ± 4.0	10.8 ± 3.6	5.14	96	<.001	1.03	Rural > Urban (large)
Social Support (12–84)	51.8 ± 7.8	55.4 ± 8.1	−2.22	98	.029	0.44	Urban > Rural (small-to-moderate)
Treatment Adherence (%)	71.0 ± 9.6	76.6 ± 9.9	−2.78	97	.006	0.56	Urban > Rural (moderate)

Discussion

The t-tests confirmed statistically significant differences:

- **Depression & Distress**: Rural mothers scored significantly higher, suggesting greater vulnerability due to limited health resources and social stigma.
- **Coping**: Urban mothers used significantly more problem-focused strategies, while rural mothers leaned on emotion-focused coping.
- **Stigma**: Effect size was **large (d = 1.03)**, highlighting stigma as a major barrier for rural women.
- **Social Support & Adherence**: Urban women benefited from higher support and better adherence.

These findings resonate with the **stress-buffering model of social support** and prior Indian studies (Chandran et al., 2002; Patel et al., 2012), which show rural women face structural and cultural barriers to mental health care.

6. Integration with Literature and Frameworks

The results affirm that **postpartum depression is highly prevalent** and shaped by socio-cultural determinants. Consistent with **Lazarus and Folkman's stress and coping theory**, urban mothers' problem-focused coping protected them from higher distress. Rural mothers' emotion-focused coping and heightened stigma perpetuated depressive symptoms.

The findings echo **TB-related stigma literature**, where rural patients often internalize shame and hide illness, paralleling maternal mental health stigma. Just as stigma impedes TB treatment adherence, here it reduces mental health help-seeking.

This study highlights that maternal mental health in Nalanda is influenced not only by individual factors but also by **residence, education, coping styles, and social support**. Rural mothers face compounded disadvantages, higher depression, stigma, and weaker coping, while urban mothers fare better due to access and awareness.

The t-test analysis demonstrates that these differences are statistically significant, urging targeted interventions:

- **Rural areas** need stigma-reduction campaigns and accessible counseling.
- **Urban mothers** benefit from structured support networks, which should be replicated in villages.

Ultimately, maternal mental health cannot be isolated from **socio-economic and cultural context**, making community-based, culturally sensitive interventions essential.

Conclusion

The present study on maternal mental health and postpartum depression in Nalanda district revealed a high prevalence of depressive symptoms, with more than half of the mothers crossing the clinical cut-off on the EPDS. The t-test analysis demonstrated significant differences between rural and urban participants, with rural mothers reporting higher levels of depression, distress, emotion-focused coping, and stigma perception, whereas urban mothers showed greater reliance on problem-focused coping, stronger social support, and better treatment adherence. These findings highlight that socio-cultural context and healthcare access play a crucial role in shaping maternal psychological outcomes.

For clinical psychology practice, the results emphasize the need for early screening, counseling interventions, and psychoeducation programs tailored to rural populations where stigma remains high. Integrating mental health support into routine maternal and child healthcare, especially through ASHA workers and community health centers, could reduce the treatment gap. In parallel, lessons from TB management programs, such as structured adherence support, community sensitization, and stigma reduction campaigns, can be adapted to maternal mental health care, ensuring that postpartum women receive both medical and psychological support in an accessible, culturally sensitive manner.

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