Original Article

# Assessment of Postnatal Depression among Mothers after Normal and Cesarean Deliveries and Their Experiences with Cesarean Section: A Mixed Method Approach

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## Abstract

**Introduction:** Postpartum depression (PPD) is a common mental health issue affecting 10%–15% of women after childbirth, characterized by sadness, anxiety, and fatigue that can hinder a mother's ability to care for herself and her newborn. This study aimed to assess PPD levels and experiences among mothers who underwent lower segmental caesarean sections (LSCS) and normal deliveries. **Materials and Methods:** A mixed-method approach with an explanatory sequential design was used, involving 100 postnatal mothers selected through purposive sampling. Data were collected using structured questionnaires, the Zung self-rating depression scale, and semi-structured interviews. **Results:** Results showed that among cesarean delivery mothers, 56% had moderate depression, 24% had mild depression, and 20% had severe depression. For mothers with normal deliveries, 90% had mild depression, and 10% had no depression. A statistically significant difference ($P < 0.001$) indicated that cesarean-delivery mothers experienced higher levels of depression. Qualitative analysis identified six themes from the experiences of cesarean delivery mothers: emotional and psychological distress, impact on mother–infant bonding, social isolation, the stigma surrounding PPD, coping mechanisms, and the role of healthcare providers. **Conclusion:** The study concluded that postnatal depression is more prevalent in cesarean delivery mothers than those with normal deliveries, emphasizing the need for targeted interventions and support systems to address their psychological needs.

**Keywords:** Cesarean delivery mother, normal delivery mothers, postnatal depression, postnatal mothers, Zung self-rating depression scale

## Introduction

Postpartum depression (PPD) is a common mental health issue affecting mothers worldwide, with prevalence varying across regions.[1] Factors such as ethnicity, education, marital status, and stressful life events influence PPD rates.[2,3] Delivery type also plays a role, with cesarean sections, especially emergency ones, linked to a higher risk of depression and posttraumatic stress disorder.[4] Some studies suggest that PPD is more common in cesarean mothers in the early postpartum period, though this may not last long term. Social pressures surrounding childbirth can also impact mental health, making some mothers feel inadequate if they do not have a "normal" birth.[5]

Despite existing research, key gaps remain. Most studies focus on PPD prevalence rather than comparing its severity between normal and cesarean deliveries. There is also limited research on how cultural beliefs and societal expectations influence maternal mental health, particularly in Asian populations. In addition, while quantitative studies assess depression levels, few explore mothers' personal experiences, especially after cesarean births.[6]

This study aims to fill these gaps using a mixed methods approach, combining statistical analysis with real-life experiences of mothers. The findings will help develop better, culturally sensitive mental health support for postpartum women.

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### Primary objectives

1 To compare postnatal depression levels between normal and cesarean delivery mothers.

### Secondary objectives

1 To determine the association between postnatal depression levels and demographic variables in normal and cesarean delivery mothers
2 To explore the experiences of mothers who have undergone cesarean delivery.

## Materials and Methods

A descriptive mixed-method research approach with an explanatory sequential design was used. Quantitative data were first collected to assess postpartum depression levels among postnatal mothers. This was followed by qualitative data to gain deeper insights into the findings. The study was conducted in postnatal wards in an urban community health center after receiving ethical approval between March and May 2024. The sample selection for this study was calculated using a formula that incorporates a 95% confidence level and a 10% estimated prevalence of postpartum depression, resulting in an initial sample size of approximately 89.[7] After adjusting for a design effect of 1.5, the total sample size needed was around 100. Ultimately, 100 participants were selected, evenly divided between normal vaginal and cesarean deliveries, ensuring reliable comparative analysis of postpartum depression levels.

Purposive sampling was used to select the participants.

### Inclusion criteria

The criteria for selecting participants in this study included postnatal mothers who were between the 3rd and 5th days after delivery, available during the data collection period, and either primi or multigravida. In addition, participants were required to speak and understand Tamil or English and to be willing to participate in the study. Mothers who had experienced either a cesarean section (LSCS) or a normal delivery with a living child were included in the sample.

### Exclusion criteria

The exclusion criteria for this study included postnatal mothers who had a history of severe mental health disorders before pregnancy, were experiencing acute medical conditions or complications postdelivery, or had infants admitted to the neonatal intensive care unit at the time of data collection. In addition, mothers who were unable to communicate effectively in Tamil or English or who declined to participate in the study or withdrew consent at any stage were also excluded from the study.

The data collection tool consisted of three parts:

- Part I: Background data, including demographic, sociocultural, and delivery-related factors
- Part II: Depression levels assessed using the Zung self-rating depression scale, a standardized tool available in Tamil
- Part III: Semi-structured interviews exploring cesarean section experiences.

### Phase II: Qualitative phase

A descriptive phenomenological approach was used to explore the experiences of mothers who underwent cesarean sections. A subset of six cesarean mothers (three electives and three emergencies) from Phase I was selected for interviews. These women were approached during Phase I and provided written consent to participate.

### Inclusion criteria

First-time mothers who had elective or emergency cesareans and spoke Tamil.

### Exclusion criteria

Mothers with psychological or medical complications, previous births, or major recent life events were excluded.

### Data collection

Data were gathered through in-depth, semi-structured interviews with open-ended questions based on insights from the quantitative phase. The researcher ensured data validity by reviewing the process and aligning it with research objectives. Interviews explored postpartum emotions, mother–infant bonding, social support, stigma, and healthcare experiences. Nonverbal cues such as tone, facial expressions, and body language were carefully noted, along with the time and setting of each session. Sampling continued until data saturation was reached, ensuring a thorough understanding of mothers' lived experiences.

### Ethical consideration

The study received ethical approval from the Institutional Ethics Committee, reference number (IEC/UHP/178/2024), to ensure compliance with ethical standards in research involving human participants. Informed consent was obtained from all participants, and confidentiality was maintained throughout the study.

### Data analysis

SPSS version 22.0 (IBM Corp., Armonk, NY, USA) was used for quantitative analysis, with descriptive statistics summarizing participant characteristics and depression levels. An independent *t*-test compared depression between normal and cesarean delivery groups, while the Chi-square test examined associations with factors such as maternal age and breastfeeding difficulties. Pearson's correlation assessed relationships between depression scores and demographic variables. In the qualitative phase, semi-structured interviews explored postpartum emotions, mother–infant bonding, social support, stigma, and healthcare experiences. Nonverbal cues such as tone, expressions, and body language were also noted. Interview data were transcribed, translated, and analyzed using Colaizzi's method, identifying key themes related to maternal experiences after cesarean delivery.

## Results

Table 1 shows the background details of postnatal mothers

who had normal and cesarean (LSCS) deliveries. Most mothers were between 19 and 28 years old, and most husbands were between 24 and 34 years. The majority of families followed Hinduism. Many mothers had studied up to a higher secondary level, and most husbands were also well-educated. Mothers were mostly homemakers, while husbands worked in private jobs. Most families earned below ₹20,000 per month. Almost all couples lived together and were from urban areas.

Most marriages were nonconsanguineous, and many couples were married for more than 2 years. Both primi and multipara mothers were almost equal. Nuclear families were more common. Most mothers had good family support and good relationships with their husbands, though some LSCS mothers reported issues with in-laws. A few mothers expressed gender preference. Substance use among husbands and family history of psychiatric illness were reported only by a small number of participants.

Table 2 shows the delivery-related details of mothers. Most mothers with cesarean delivery had pain after delivery, while fewer normal delivery mothers had pain. Male babies were slightly more in both groups. Almost all babies had normal birth weight. About half of the mothers in both groups had problems with breastfeeding. Many pregnancies were unplanned. Some mothers had a history of abortion. Tubectomy was done for about one-third of the mothers. Health problems in mothers were more common in the cesarean group. Very few babies had birth defects in both groups.

Table 3 presents the levels of postnatal depression among mothers with normal and cesarean deliveries. Among normal delivery mothers, 90% experienced mild depression, 10% had moderate depression, and none had severe depression. In contrast, for mothers who underwent cesarean delivery, 24% had mild depression, 56% had moderate depression, and 20% experienced severe depression. This indicates that postnatal depression is more prevalent and severe among cesarean delivery mothers.

## Compares the levels of postnatal depression between mothers who had normal deliveries and those who underwent cesarean delivery

The levels of postnatal depression were compared between mothers who had normal deliveries and those who underwent cesarean section using the *Z*-test. The results revealed a significant difference in the distribution of depression levels between the two groups. Among mothers with normal deliveries, 90% experienced mild depression and 10% had moderate depression, with no cases of severe depression. In contrast, among mothers who had cesarean deliveries, only 24% had mild depression, while 56% experienced moderate depression and 20% suffered from severe depression. These findings indicate that postnatal depression is not only more prevalent but also more severe among mothers who underwent cesarean delivery compared to those who had normal vaginal births.

**Table 1: Frequency and percentage distribution of demographic and Sociocultural variables of postnatal mothers among normal and cesarean delivery mothers**

| | Normal delivery, frequency (%) | LSCS, frequency (%) |
|---|---|---|
| Demographic variables | | |
| Mothers age (years) | | |
| 15–18 | 3 (06.0) | 6 (12.0) |
| 19–23 | 20 (40.0) | 12 (24.0) |
| 24–28 | 15 (30.0) | 17 (34.0) |
| 29–34 | 10 (20.0) | 15 (30.0) |
| >34 | 2 (04.0) | 0 |
| Husbands age (years) | | |
| 19–23 | 1 (2.0) | 3 (6.0) |
| 24–28 | 23 (46.0) | 18 (36.0) |
| 29–34 | 20 (40.0) | 21 (42.0) |
| >34 | 6 (12.0) | 8 (16.0) |
| Religion | | |
| Hindu | 33 (66.0) | 31 (62.0) |
| Christian | 16 (32.0) | 14 (28.0) |
| Muslim | 1 (2.0) | 5 (10.0) |
| Literacy of the mother | | |
| Illiteracy | 0 | 1 (2.0) |
| Primary | 2 (4.0) | 3 (6.0) |
| Elementary | 5 (10.0) | 6 (12.0) |
| High school | 7 (14.0) | 3 (6.0) |
| Higher secondary | 28 (56.0) | 22 (44.0) |
| Diploma | 2 (4.0) | 0 |
| Graduate | 6 (12.0) | 15 (30.0) |
| Literacy of the husband | | |
| Illiteracy | 0 | 1 (2.0) |
| Primary | 2 (4.0) | 2 (4.0) |
| Elementary | 3 (6.0) | 1 (2.0) |
| High school | 6 (12.0) | 8 (16.0) |
| Higher secondary | 17 (34.0) | 15 (30.0) |
| Diploma | 8 (16.0) | 6 (12.0) |
| Graduate | 14 (28.0) | 17 (34.0) |
| Occupation of the mother | | |
| Home maker | 28 (56.0) | 31 (62.0) |
| Self-employer | 14 (28.0) | 12 (24.0) |
| Private job | 8 (16.0) | 7 (14.0) |
| Occupation of the husband | | |
| Coolie | 9 (18.0) | 7 (14.0) |
| Self-employer | 9 (18.0) | 12 (24.0) |
| Private job | 32 (64.0) | 31 (62.0) |
| Family income (Rs.) | | |
| <20,000 | 40 (80.0) | 32 (64.0) |
| 21,000–30,000 | 8 (16.0) | 16 (32.0) |
| 31,000–40,000 | 2 (4.0) | 2 (4.0) |
| Couple status | | |
| Staying together | 49 (98.0) | 42 (84.0) |
| Staying separated | 1 (2.0) | 8 (16.0) |
| Residence | | |
| Urban | 50 (100.0) | 50 (100.0) |

*Contd...*

**Table 1: Contd...**

| | Normal delivery, frequency (%) | LSCS, frequency (%) |
|---|---|---|
| Sociocultural factors | | |
| Marriage type | | |
| Nonconsanguineous marriage | 38 (76.0) | 35 (70.0) |
| Consanguineous marriage | 12 (24.0) | 15 (30.0) |
| Degree of consanguinity (°) | | |
| 1 | 3 (25.0) | 5 (33.3 |
| 2 | 9 (75.0) | 10 (66.7 |
| Duration of marriage life (months) | | |
| <24 | 22 (44.0) | 19 (38.0) |
| More than 24 | 28 (56.0) | 31 (62.0) |
| Para | | |
| Primi | 27 (54.0) | 26 (52.0) |
| Multi | 23 (46.0) | 24 (48.0) |
| Type of family | | |
| Nuclear | 44 (88.0) | 38 (76.0) |
| Joint | 6 (12.0) | 12 (24.0) |
| Family support | | |
| Good | 48 (96.0) | 39 (78.0) |
| Not good | 2 (4.0) | 11 (22.0) |
| Relationship with husband | | |
| Good | 49 (98.0 | 49 (98.0) |
| Not good | 1 (2.0 | 1 (2.0) |
| Relationship with in-laws | | |
| Good | 43 (86.0) | 37 (74.0) |
| Not good | 7 (14.0) | 13 (26.0) |
| Gender preference | | |
| Yes | 14 (28.0) | 15 (30.0) |
| No | 36 (72.0) | 35 (70.0) |
| History of substance use in husband | | |
| Yes | 18 (36.0) | 17 (34.0) |
| No | 32 (64.0) | 33 (66.0) |
| Family history of psychiatric illness | | |
| Yes | 2 (4.0) | 2 (4.0) |
| No | 48 (96.0) | 48 (96.0) |

LSCS: Lower segment cesarean sections

## Phase II: Qualitative phase-thematic analysis

Table 4 shows that, Mothers who had cesarean sections faced emotional challenges such as sadness, anxiety, and guilt due to the stress of recovery and new motherhood. Many found it hard to bond with their babies, leading to feelings of inadequacy. Despite being around family, they often felt isolated and misunderstood, especially by their partners. Fear of judgment made it hard for them to ask for help. Some found comfort in talking to loved ones or professionals, while others withdrew. Positive support from healthcare providers helped, but negative experiences made things worse. These findings show the importance of both emotional and physical support for new mothers.

## Discussion

This study found that mothers who had cesarean sections

**Table 2: Frequency and percentage distribution of delivery factors of postnatal mothers among normal and cesarean delivery mothers**

| Delivery factors | Normal delivery, frequency (%) | Cesarean delivery, frequency (%) |
|---|---|---|
| Pain after delivery | | |
| Yes | 28 (56.0) | 48 (96.0) |
| No | 22 (44.0) | 2 (4.0) |
| Sex of baby | | |
| Male | 27 (54.0) | 29 (58.0) |
| Female | 23 (46.0) | 21 (42.0) |
| Birth weight of baby - normal | | |
| Yes | 48 (96.0) | 47 (94.0) |
| No | 2 (4.0) | 3 (6.0) |
| Breast feeding problem | | |
| Yes | 28 (56.0) | 29 (58.0) |
| No | 22 (44.0) | 21 (42.0) |
| Planned pregnancy | | |
| Yes | 24 (48.0) | 23 (46.0) |
| No | 26 (52.0) | 27 (54.0) |
| Previous abortion | | |
| Yes | 10 (20.0) | 14 (28.0) |
| No | 40 (80.0) | 36 (72.0) |
| Sterilization done | | |
| Yes | 18 (36.0) | 19 (38.0) |
| No | 32 (64.0) | 31 (62.0) |
| Maternal comorbidities | | |
| Yes | 4 (8.0) | 11 (22.0) |
| No | 46 (92.0) | 39 (78.0) |
| Congenital comorbidities | | |
| Yes | 1 (2.0) | 1 (2.0) |
| No | 49 (98.0) | 49 (98.0) |

experienced higher levels of postpartum depression (PPD) compared to those who had normal vaginal deliveries, as shown in Table 5. The average depression score was significantly higher in the cesarean group (62.98) compared to the normal delivery group (48.4). These results align with the findings of Selvam *et al*.,[7-9] who also reported an increased risk of PPD among Caesarean mothers due to factors such as surgical recovery, physical stress, and the trauma of surgery.

Interestingly, Table 2 highlights that a significant proportion of Caesarean mothers reported postdelivery pain and breastfeeding challenges, which are often linked to higher depression scores. A study by Johnson[10,11] found that 12% of first-time mothers experienced PPD, with higher levels of depression reported among those who had vaginal deliveries. This contrasts with our findings, where cesarean mothers were more likely to experience severe depression, possibly due to the additional physical recovery required after surgery. Kawai *et al*.[11] also identified postdelivery pain and breastfeeding difficulties as contributors to depression, particularly in the postcaesarean group.

Further, Table 5 shows that another study by Ullangula *et al*.[12,13] reported that PPD among normal delivery mothers

was influenced by educational level and place of residence, while for cesarean mothers, factors such as birth order, income, education, and family type were more significant. These factors must be considered when addressing the psychological well-being of postnatal mothers, particularly those recovering from cesarean sections.

Qualitative data from this study further enriched the findings. Mothers who underwent Caesarean sections expressed feelings of guilt, anxiety, and difficulty bonding with their newborns. These emotional struggles were often intensified by the physical demands of recovery. This supports findings from Morrell *et al* (2016)[14] and Wang R. *et al* (2021)[15], who noted that surgical recovery can impact maternal–infant bonding. Ning *et al*. (2024)[16] and Xu *et al*. (2017)[17] also found a statistically significant association between caesarean birth and an increased risk of postpartum depression. In addition, many mothers reported a lack of social support and a fear of mental health stigma, which worsened their emotional well-being. This aligns with research by Wan Mohamed Radzi *et al*. (2021)[18] and Zakeri *et al*. (2022)[19], who emphasized the critical role of strong social networks and psychosocial support in mitigating the risk of PPD. Moreover, Rani (2024)[20] provided qualitative insights into the lived experiences of caesarean mothers with PPD, highlighting feelings of helplessness and emotional detachment.

**Table 3: Level of postnatal depression among normal and cesarean delivery mothers**

| Level of depression | Normal delivery | LSCS |
|---|---|---|
| Mild depression | 45 (90.0) | 12 (24.0) |
| Moderate depression | 5 (10.0) | 28 (56.0) |
| Severe depression | - | 10 (20.0) |

In Normal delivery no one under severe depression. LSCS: Lower segment cesarean section

In conclusion, the study underscores the importance of providing comprehensive and individualized postpartum care – especially for mothers recovering from cesarean deliveries – to address both physical and emotional needs.

## Integration of quantitative and qualitative data

This study's integration of quantitative and qualitative data provides a comprehensive understanding of postpartum depression (PPD). Quantitative findings showed higher depression scores among cesarean mothers, while qualitative interviews revealed emotional challenges such as guilt, anxiety, bonding difficulties, and social stigma. Together, these results highlight the need for targeted interventions that address both the prevalence and lived experiences of PPD to improve postpartum care.

## Recommendations

- Tailored postnatal care: Create postnatal programs that specifically address emotional and mental health needs, especially for mothers who had a cesarean section

**Table 4: The analysis yielded six major themes, each shedding light on different aspects of the mother's experiences**

| Themes | Sub-themes | Participant quotes |
|---|---|---|
| 1. Emotional and psychological distress | 1.1: Feelings of overwhelm and sadness | *"I felt like I was drowning in all the responsibilities. The baby cries, the house, everything felt too much. I was not happy like I thought I would be"* |
| | 1.2: Anxiety and fear | *"Every time my baby coughed; I panicked. I kept thinking, am I doing enough? What if something happens to her? It was exhausting"* |
| | 1.3: Guilt and shame | *"I felt guilty for not enjoying motherhood. Everyone told me it's supposed to be the happiest time, but I just felt lost and ashamed of it"* |
| 2. Impact on mother-infant bonding | 2.1: Difficulty in bonding with the baby | *"I struggled to connect with my baby. I would hold her, but it felt like I was just going through the motions. It made me feel even worse"* |
| | 2.2: Fear of not meeting maternal expectations | *"I was scared that everyone expected me to feel this instant bond. When it didn't happen, I thought something was wrong with me"* |
| 3. Social isolation and lack of support | 3.1: Loneliness and feeling of abandonment | *"I felt so alone, even with family around. They didn't understand what I was going through, and it made me feel invisible"* |
| | 3.2: Perceived lack of understanding from partner | *"My husband tried to help, but he did not really get how I felt. Sometimes, I felt he thought I was overreacting"* |
| 4. Stigma surrounding postnatal depression | 4.1: Fear of Judgment | *"I worried about what people would think if I told them I was struggling. It felt like I had to put on a brave face all the time"* |
| | 4.2: Reluctance to seek help | *"I knew I needed help, but I was afraid to talk to anyone. What if they thought I was a bad mother?"* |
| 5. Coping mechanisms | 5.1: Reliance on family and friends | *"Talking to my sister helped. Just having someone listen made a difference. I didn't feel so alone in my struggles"* |
| | 5.2: Professional support | *"When I finally spoke to a counsellor, it was a relief. I felt understood, and it gave me tools to manage my feelings better"* |
| | 5.3: Negative coping strategies | *"Sometimes, I just shut myself in my room. I thought isolating would help, but it only made things worse"* |
| 6. Role of healthcare providers | 6.1: Positive experiences with healthcare providers | *"I had a great nurse who checked in on me. She listened and made me feel like my feelings were valid. It helped a lot"* |
| | 6.2: Negative experiences with healthcare providers | *"When I tried to talk to my doctor about feeling down, I felt brushed off. It was like my concerns did not matter, which made me feel worse"* |

**Table 5: Association between postnatal depression and demographic variables**

| Demographic variables | Level of PN depression LSCS | | Chi-square test |
|---|---|---|---|
| | Mild | Moderate | |
| Mothers age (years) | | | |
| 15–18 | 0 | 6 | $\chi^2$=10.720 |
| 19–23 | 2 | 10 | *P*=0.013 significant |
| 24–28 | 2 | 15 | |
| 29–34 | 8 | 7 | |
| Husbands age (years) | | | |
| 19–23 | 0 | 3 | $\chi^2$=8.272 |
| 24–28 | 1 | 17 | *P*=0.041 significant |
| 29–34 | 7 | 14 | |
| >34 | 4 | 4 | |
| Duration of marriage life (months) | | | |
| <24 | 0 | 19 | $\chi^2$=9.677 |
| More than 24 | 12 | 19 | *P*=0.002 significant |
| Para | | | |
| Primi | 1 | 25 | $\chi^2$=12.062 |
| Multi | 11 | 13 | *P*=0.001 significant |
| Type of family | | | |
| Nuclear | 6 | 32 | $\chi^2$=5.852 |
| Joint | 6 | 6 | *P*=0.016 significant |
| Breast feeding problem | | | |
| Yes | 2 | 27 | $\chi^2$=11.074 |
| No | 10 | 11 | *P*=0.001 significant |
| Sterilization done | | | |
| Yes | 9 | 10 | $\chi^2$=9.175 |
| No | 3 | 28 | *P*=0.002 significant |

LSCS: Lower segment cesarean section, PN: Postnatal

- Training for healthcare providers: Train healthcare professionals to recognize and address postnatal depression (PPD) and provide empathetic support
- Peer support networks: Establish support groups where mothers can connect with others and share experiences, reducing isolation and stigma
- Routine mental health screenings: Include regular mental health checks in postnatal visits to catch signs of PPD early and provide timely help
- Increase public awareness: Launch campaigns to educate families and mothers about PPD, its symptoms, and available support to reduce stigma and encourage seeking help.

## Limitation

The study's cross-sectional design limits the ability to draw causal conclusions or assess the long-term psychological effects of delivery methods on postpartum depression, as data are collected at only one point in time. In addition, reliance on self-reported questionnaires may introduce bias, as participants could minimize their symptoms due to stigma or fear of judgment, impacting the reliability of the findings. Finally, the small number of qualitative interviews restricts the range of experiences captured, potentially overlooking the diverse emotions and challenges faced by mothers after different delivery types.

## Conclusion

The study revealed that mothers who underwent LSCS experienced higher levels of postnatal depression compared to those who had normal deliveries. It underscores the importance of awareness programs focused on postnatal care and mental health management. Such interventions can help reduce postnatal depression and improve the physical and psychological well-being of both mothers and their babies.

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## Conflicts of interest

There are no conflicts of interest.

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