Volume 4, Issue 1, 2026

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

FACTORS ASSOCIATED WITH THE DEVELOPMENT OF POSTNATAL DEPRESSION AFTER CAESAREAN DELIVERY: A CROSS-SECTIONAL STUDY

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DOI: https://doi.org/10.5281/zenodo.18409518

Keywords

pain, central sensitization, anxiety, anticipated pain medication needs.

Article History

Received: 28 November 2025
Accepted: 12 January 2026
Published: 29 January 2026

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Abstract

Background: *Post-natal depression (PND) is a common issue that some women face after having a cesarean section. It is often overlooked and not taken seriously when it comes to women's health. Its growth is affected by things like history of smoking, presence of comorbidities, pain at rest or movement and preoperative anxiety.*

Objectives: *To evaluate the Factors associated with the Development of Postnatal Depression after Cesarean Delivery.*

Methodology: *A descriptive cross-sectional study was conducted between 104 women to evaluate the Factors associated with the Development of Postnatal Depression after Cesarean Delivery. Mean and standard deviated was computed of all descriptive variables, chi-square test and independent t-test applied to other variables.*

Results: *Among the 104 patients, there was strong positive association between anxiety and PND. Post-natal depression is influenced by multiple factors , some of them in my study was non-significant like no. of children and comorbidities etc. But independent t-test shows significant results in the form of p-values (>0.05) of variables that are associated with post-natal depression after cesarean delivery are history of smoking, age, past cesarean deliveries, BMI, caffeine usage and pain at movement post-operatively (0.02), correlation of age (0.05), past C-section (0.03) and paracetamol dose (0.02).*

Conclusion: *This study found that after the surgery, most of women develop post-natal depression. Most of the factors that are associated with post-natal depression after cesarean delivery are history of smoking, age, past cesarean deliveries, BMI, caffeine usage etc. While Paracetamol was somewhat beneficial, Mefenamic acid proved to be largely ineffective, and tramadol allowed users to take less Paracetamol without substantially relieving their discomfort. These results show that using different types of stress control strategies and pain relief methods together is important for improving pain control and making patients happier after surgery.*

INTRODUCTION

More people are understanding how important mental health is for mothers. The global rate of PND (Postnatal Depression) varies between 7.6% and 39%. The impact of PND can have a big effect

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

because it can hurt not just people's health but also other areas of their lives mother and her bond with her baby, and later with her growing child physical and brain development results. Also, PND might also help cause long-term health problems that can lead to social and financial issues about families and communities. (1).

Psychological trauma during childbirth means experiencing intense emotional pain or distress while giving birth. Post-traumatic stress disorder (PTSD) is a condition that can occur after someone experiences a very scary or harmful event. It can cause feelings of anxiety, flashbacks, and trouble sleeping. The signs of the problem PTSD can have big and lasting effects on a mother's life later on. Many studies have shown that a large number of mothers People diagnosed with PTSD often show signs of severe depression and think about suicide more often more than 90%. (2).

Many mothers encounter postnatal depression (PND), a frequent mental health concern that arises after they give birth. It includes feelings of ongoing sadness, tiredness, worry, and difficulty connecting with their baby. A C-section, while sometimes needed to keep the mother or baby safe, can lead to a higher risk of postpartum depression. This can happen because of stress from the surgery, pain after the operation, and the emotional effects of needing an emergency procedure. Women who have a C-section are more likely to feel sad and stressed, which can increase their chances of developing postnatal depression. It's important to understand how C-sections are related to postnatal depression (PND) so we can create effective ways to help new mothers with their mental health after childbirth. (3).

The rate of cesarean deliveries has increased more than 10 times in the past 70 years and is now close to 39 percent. The lasting effects of more surgeries in young women have not been fully examined. Tissue damage from surgery is a common problem. Women are more likely than men to experience long-lasting pain and disabilities having long-lasting pain after surgery and showing more severe pain. This condition could lead to lasting pain. A small survey in a group of people outside the US showed about 6% of people still feel daily pain a year after having surgery for CD (which I assume means Crohn's disease), but there haven't been any studies looking ahead to confirm this. Research comparing how often long-lasting pain happens after C-sections and vaginal births. (4)

Many pregnant women are afraid or depressed of giving birth linked to a past bad birth experience, a higher chance of needing surgery during delivery "During the delivery and when feeling sad." as types of anxiety disorders. There are also signs that stress, worry, or sadness in mothers could be harmful to the baby and young children baby. A strong fear of giving birth can be described as Fear before, during, or after giving birth. It seems like your message was cut off. A woman is scared of becoming pregnant or having a baby. The fear and depression interferes with her everyday life and activities. Women who are very scared of giving birth might find help from care. (5)

The visit involves checking the issue and making a plan the advice to follow. The number of visits can change, but It's normal for there to be two to four visits, and the dad-to-be is typically found during one or more of these times. A midwife gives advice, and in important situations, can recommend the woman to a therapist training relaxation method are learned and used a few clinics. A visit to the nearby delivery room is an important part of the advice. A birth plan is usually created when having a baby to help the delivery room staff. An obstetrician is a doctor who helps women during pregnancy and childbirth always present during a C-section or other childbirth procedures. Actions are being thought about. (6)

Postnatal depression (PND) is a significant public health concern that affects mothers' emotional well-being and can have lasting consequences on the newborn's development, family relationships, and overall quality of life. Globally, the prevalence of PND ranges between 10– 20%, with even higher rates reported in low- and middle-income countries such as Pakistan due to limited psychosocial support, economic stress, and cultural stigma surrounding mental health. Despite its high occurrence, PND often remains underdiagnosed and undertreated, particularly following cesarean deliveries, where physical recovery, pain, and emotional distress further increase vulnerability.

Volume 4, Issue 1, 2026

Frontier in Medical & Health Research

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Materials And Methods

A descriptive cross-sectional study was conducted Ganga Ram Hospital, Lahore of 104 women to evaluate the Factors associated with the Development of Postnatal Depression after Cesarean Delivery. A standardized questionnaire was used to collect the data. The patient with Elective Cesarean Delivery, Age 15-50 years and 36 gestational weeks or more were included in this study and patients having history of persistent pain syndrome, Intravenous drug or opioid abuse, Emergency Cesarean Delivery and Delivery under General were excluded. Mean and standard deviated was computed of all descriptive variables, chi-square test and independent t-test applied to other variables.

Parameters	Non-PND group	PND group	p-values
PCS Rumination (0-16)	6.52± 2.450	6.84± 3.045	0.03
PCS magnification (0-12)	6.15± 2.408	5.74± 2.556	0.23
PCS Helplessness (0-24)	9.82± 5.064	10.42± 5.246	0.03
PCS total score (0-52)	22.42± 6.173	23.00± 6.439	0.29
Anxiety Sub-scale (0-21)	7.93± 4.791	8.68± 4.542	0.05
Depression Sub-scale (0-21)	8.60± 5.438	6.23± 4.738	0.01
HADS Total score (0-42)	16.47± 6.760	14.94± 4.939	0.02
EPND Total score (0-30)	5.81± 2.419	18.10± 6.128	<0.01

Results

Among the 104 patients, there was strong positive association between anxiety and PND. Post-natal depression is influenced by multiple factors , some of them in my study was non-significant like no. of children and comorbidities etc.

The comparison between the non-PND and PND groups, significant differences.

They were observed in several psychological parameters. Rumination (6.84 ± 3.05 vs. 6.52 ± 2.45, p = 0.03) and helplessness (10.42 ± 5.25 vs. 9.82 ± 5.06, p = 0.03) were higher in the PND group, while magnification and total PCS scores did not differ significantly.

Cross-tabulation between post natal depression groups with all the descriptive variables.

	Post-natal depression		
Characteristic	**Non-PND groups(no)**	**PND groups (ye)**	**p-value**
Age (years)	70%	30%	0.05
Number of children	64.1%	25.9%	0.6
Past cesarean delivery	51.0%	48.1%	0.03
History of smoking	94.2%	5.8%	1.0
Comorbidities	72.1%	26.9%	0.6
Gestational diabetes	73.1%	26.9%	1.0

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

BMI Classification	60.6%	39.4%	0.83
Asthma	85.5%	14.4%	0.57
Hypertension	75.0%	25.0%	1.00
Hyperthyroidism	90.4%	9.6%	0.7
Paracetamol	11.5%	88.5%	0.35
Mefenamic acid	54.8%	45.2%	0.11
Tramadol	46.2%	53.8%	1.00
Pain at scar\wound site	51.0%	49.0%	0.57

This table shows the association between postnatal depression (PND) and different maternal characteristics. Younger age was significantly related to PND, with 30% of younger women in the PND group compared to 70% in the non-PND group (p = 0.05). A history of past cesarean delivery also showed significance, with 48.1% in the PND group versus 51.0% in the non-PND group (p = 0.03).

Cross-tabulation for Risk Factors of PND

Risk Factors	**p-values**
Pain-score with movement	0.57
Anxiety about upcoming surgery	0.05
Anticipated pain medication needs	<0.01
PCS	0.29
Pre-operative HADS-anxiety	0.02

The pain score with movement shows the insignificant association with the p-value of (0.57), and the anxiety about upcoming surgery shows the significant association with p-value of (0.05), the anticipated pain medication needs shows the significant association with the p-value of (<0.01), PCS shows the insignificant association with the p-value of (0.29) and the pre-operative HADS-anxiety shows the significant association with the p-value of (0.02).

Discussion

In this study, age was found to have a significant association with postnatal depression (PND) (p = 0.05). Younger mothers represented 30% of the PND group, whereas 70% belonged to the non-PND group, suggesting that younger maternal age is linked with a higher risk of developing PND. This finding is in line with the study of Alvarez-Segura et al. (2014), who reported that younger maternal age was significantly associated with higher rates of postpartum depressive symptoms in their cohort. They argued that limited emotional maturity, financial insecurity, and reduced social support could explain this increased vulnerability. Therefore, younger mothers should be considered a priority group for early screening and psychosocial support interventions to minimize the risk of PND.

A history of previous cesarean delivery was significantly associated with PND in our study (p = 0.03). This finding is comparable with Deninotti et al. (2020), who reported that repeated cesarean sections were associated with lower maternal

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

satisfaction, increased emotional dysregulation, and higher rates of postpartum depression and PTSD symptoms. Recurrent surgical experiences may increase psychological stress, fear, and negative childbirth perceptions, thereby elevating the risk of depression.

Pain perception and anticipated pain medication needs also showed significant associations with PND in this study. This is supported by Eisenach et al. (2008), who found that the severity of acute postoperative pain, rather than the mode of delivery itself, predicted postpartum depression and persistent pain. Likewise, Pan et al. (2013) reported that women with higher anticipated pain and analgesic requirements after cesarean delivery experienced greater emotional distress, which could contribute to depressive symptoms. These findings suggest that inadequate pain control may play a critical role in the development of PND.

Even though smoking is usually connected to bad results for mothers and babies, it is still not clear how it directly affects postnatal depression (PND). In this study, very few people smoked, which could be why the results weren't important. PND was seen in 26. 9% of women with other health issues, while it was found in 72. 1% of those without PND (p = 0. 6) this finding indicates that there is not a noticeable link between long-term health issues and PND in this group of people. However, current research shows that health problems like diabetes, high blood pressure, or thyroid issues can affect mood by causing more physical stress and hospital visits.

These issues can also affect how someone feels. The result might not be important because of the small number of samples or other factors affecting it. Only 144% of mothers with asthma had postpartum depression, while 85. 5% of mothers without asthma did (p = 0. 57). Long-term lung diseases can cause more stress, but in our group, asthma did not seem to affect the risk of depression. PND occurred in 25% of women with high blood pressure, compared to 75% of those without PND. This shows that there is no connection between the two. However, high blood pressure is linked to problems during pregnancy and anxiety in other studies. This might mean that the lack of a link in this case could be because there aren't enough cases to look at. Out of all the patients with hyperthyroidism, 9. 6% had a condition called PND, while 90. 4% did not have it.

The difference is not statistically significant (p = 0. 7). Thyroid problems can look like or make depression symptoms worse, but our study didn't find a connection between them, likely because we had too few participants.

Conclusion

This research examined the effectiveness of factors and variables that associated with postnatal depression and medications paracetamol, mefenamic acid, and tramadol in alleviating postoperative pain. The results showed that none of these drugs really helped to reduce pain by themselves. However, paracetamol did help with pain related to movement, and tramadol lowered the amount of paracetamol needed, hinting that it might help use less of that medicine. The results suggest that using different methods to manage pain is better than depending on just one medicine. PND patients experienced significantly higher rumination, helplessness, and EPND scores, reflecting a heavier burden of postnatal distress. Non-PND patients, however, showed greater depression and HADS total scores. These results emphasize the distinct psychological profiles of PND and non-PND groups.

The results shows that pain about upcoming surgery, anticipated pain medication needs, and pre-operative HADS-Anxiety shows a significant association with Edinburgh Post-Natal Depression. The pain and anxiety shows no significant association with Edinburgh Post-Natal Depression (EPND).

REFERENCES

Chan, C. L. J., Tan, C. W., Chan, J. J. I., Sultana, R., Chua, T. E., Chen, H. Y., ... & Sng, B. L. (2020). Factors associated with the development of postnatal depression after cesarean delivery: a prospective study.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Orovou, E., Antoniou, E., Zervas, I., & Sarantaki, A. (2025). Prevalence and correlates of postpartum PTSD following emergency cesarean sections: implications for perinatal mental health care: a systematic review and meta-analysis.

Deninotti, J., Denis, A., & Berdoulat, É. (2020). Emergency C-section, maternal satisfaction and emotion regulation strategies: effects on PTSD and postpartum depression symptoms.

Eisenach, J. C., Pan, P. H., Smiley, R., Lavand'homme, P., Landau, R., & Houle, T. T. (2008). Severity of acute pain after childbirth, but not type of delivery, predicts persistent pain and postpartum depression.

Nieminen, K., Stephansson, O., & Ryding, E. L. (2016). Women's fear of childbirth and preference for cesarean section–a cross-sectional study at various stages of pregnancy in Sweden.

Waldenström U et a1., 2016).

Hepp, P., Hagenbeck, C., Burghardt, B., Jaeger, B., Wolf, O. T., Fehm, T., & MAGIC Group. (2016). measuring the course of anxiety in women giving birth by caesarean section: a prospective study.

Katasani, M. R., Reddy, S., Dondapati, V., & Katasani, M. R. Evaluating the Psychological and Physical Impacts of Caesarean Section Versus Vaginal Delivery on Mothers in Postpartum Recovery:

Kuo, S. Y., Chen, S. R., & Tzeng, Y. L. (2014). Depression and anxiety trajectories among women who undergo an elective cesarean section.

Lopez, U., Meyer, M., Loures, V., Iselin-Chaves, I., Epiney, M., Kern, C., & Haller, G. (2017). Post-traumatic stress disorder in parturients delivering by caesarean section and the implication of anaesthesia: a prospective cohort study. Health and quality of life outcomes.

Mayer, T. G., Neblett, R., Cohen, H., Howard, K. J., Choi, Y. H., Williams, M. J., ... & Gatchel, R. J. (2012). The development and psychometric validation of the central sensitization inventory.

Meky HK, Shaaban MM, Ahmed MR, Mohammed TY. Prevalence of postpartum depression regarding mode of delivery: a cross-sectional study. J Matern Fetal Neonatal Med. 2019;1–8. doi:10.1080/1476 7058.2019.1571572

Pan, P. H., Tonidandel, A. M., Aschenbrenner, C. A., Houle, T. T., Harris, L. C., & Eisenach, J. C. (2013). Predicting acute pain after cesarean delivery using three simple questions..

Petrosyan, D., Armenian, H. K., & Arzoumanian, K. (2011). Interaction of maternal age and mode of delivery in the development of postpartum depression in Yerevan, Armenia. Journal of affective disorders.