*Original Article*

# The Relationship Between Postoperative Pain and Sleep Quality in Cesarean Section Patients at Koja Hospital

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## Abstract

**Background:** Maternal mortality continues to be a pressing global health issue, particularly in low- and middle-income countries. Postpartum complications, including poor sleep quality, can impede maternal recovery and are often exacerbated by unmanaged postoperative pain following cesarean section. Understanding the link between pain and sleep disturbance is critical to enhancing maternal care and recovery outcomes.
**Objective:** This study aimed to examine the correlation between postoperative wound pain and sleep quality among women undergoing cesarean section at Koja District Hospital in 2020.
**Methods:** A cross-sectional study was conducted involving 40 postpartum women who met the inclusion criteria. Participants were selected through total sampling. Pain intensity was measured using a standardized numerical pain rating scale, while sleep quality was assessed using a validated sleep quality questionnaire. Data were analyzed using the Pearson chi-square test to evaluate the relationship between pain severity and sleep quality.
**Results:** The analysis revealed a statistically significant correlation between the intensity of cesarean wound pain and sleep quality (p = 0.001). Women reporting higher levels of postoperative pain were more likely to experience disturbed or poor-quality sleep.
**Conclusion**: A significant relationship exists between postoperative pain and sleep quality in post-cesarean patients. These findings underscore the importance of effective pain management as part of comprehensive postpartum care to improve sleep quality and facilitate optimal recovery. Future studies are recommended to explore longitudinal effects and potential interventions targeting both pain and sleep in the postpartum period.

**Keywords**: Cesarean Section, Maternal Health, Postoperative Pain, Postpartum Recovery, Sleep Quality

## INTRODUCTION

Basic human needs are essential elements required to maintain an individual's physiological and psychological equilibrium, which in turn supports survival and overall health. According to Maslow's hierarchy of needs, every individual possesses five levels of needs: physiological, safety, love and belonging, self-esteem, and self-actualization. Among these, physiological needs form the foundation and include oxygen, fluid intake, nutrition, body temperature regulation, elimination, shelter, sexual needs, and crucially, rest and sleep (1,2)

A cesarean section (sectio caesarea or SC) is a surgical procedure performed under anesthesia in which the fetus, placenta, and amniotic fluid are delivered through incisions in the abdominal and uterine walls. This operation is typically carried out once fetal viability is reached, generally beyond 24 weeks of gestation (3,4). Postoperative pain is a common consequence of this procedure, and individuals experiencing pain often require more sleep for adequate recovery. Quality sleep facilitates cellular regeneration and supports physical and emotional healing. In postoperative patients, sleep disturbances are prevalent and can hinder the healing process (5–7)

Sleep serves multiple restorative functions, including tissue repair, immune response modulation, and cognitive and behavioral recovery. In the context of maternal health, particularly following a cesarean section, adequate sleep is vital not only for physiological recovery but also for the mother's ability to participate actively in newborn care, such as breastfeeding, early mobilization, and personal hygiene practices (8,9). Maternal mortality is defined as the death of a woman during pregnancy or within 42 days of the termination of pregnancy, regardless of its duration or outcome. In 2018, the global maternal mortality ratio (MMR) was 210 deaths per 100,000 live births, with developing countries experiencing even higher rates—up to 230 deaths per 100,000 live births [5,6]. In Indonesia, the prevalence of cesarean sections is notably high, accounting for approximately 30% to 80% of all deliveries. According to the 2007 national survey, there were 927,000 cesarean deliveries out of 4,039,000 total births [12].

Pain at the surgical site is one of the most commonly reported complaints among post-cesarean patients. This is a normal response to tissue injury; however, if unmanaged, pain can significantly affect sleep patterns, nutritional intake, energy levels, and daily activities [9]. Postoperative pain generally peaks within 12 to 36 hours and gradually subsides by the third day [10]. In some cases, complications such as wound infection, delayed healing, or suture dehiscence may exacerbate pain and prolong recovery (10).

Global data also indicate a rising trend in cesarean deliveries, with a 46% increase in China and 25% increases in regions across Asia, Europe, and Latin America [9,11]. This growing prevalence underscores the importance of addressing postoperative outcomes such as pain and sleep disturbances in post-cesarean patients. Based on the context outlined above, this study aims to examine the correlation between post-cesarean wound pain intensity and sleep quality among women recovering from sectio caesarea procedures.

## METHODS

### Study Design

This study employed a descriptive correlational design with a quantitative cross-sectional approach, which is appropriate for examining the association between two or more variables without manipulating any conditions or interventions (11). The research aimed to explore the relationship between post-cesarean wound pain intensity and sleep quality among postpartum women at Koja District Hospital, Indonesia.

### Sample

The target population comprised postpartum women who had undergone a cesarean section at Koja District Hospital. A total of 40 participants were selected as the study sample using total sampling, in which all eligible individuals meeting the inclusion criteria during the data collection period were invited to participate. Inclusion criteria included: (1) postpartum mothers who underwent elective or emergency cesarean delivery; (2) aged 18–45 years; (3) within the first 3 days postpartum; (4) able to communicate and fill out questionnaires independently; and (5) willing to provide informed consent. Exclusion criteria were: (1) patients with postoperative complications such as wound infection or hemorrhage; (2) those receiving strong sedative medications; and (3) mothers with a pre-existing sleep disorder or diagnosed mental health condition. Sample size justification was based on the minimum sample required for correlational analysis with an expected medium effect size (r = 0.4), alpha of 0.05, and 80% power. Using G*Power software, the minimum required sample was 37. To accommodate potential dropouts, 40 participants were recruited.

### Instruments

Sleep quality was assessed using a modified version of the Pittsburgh Sleep Quality Index (PSQI) developed by Buysse et al. (12), which

has been widely validated in both clinical and non-clinical populations. The PSQI consists of 19 items grouped into seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each component is scored on a 0–3 scale, and the global PSQI score ranges from 0 to 21, with higher scores indicating poorer sleep quality. A total score >5 reflects poor sleep quality. The PSQI has demonstrated high internal consistency, with a Cronbach's alpha of 0.83 in the original study For this study, a culturally adapted Indonesian version of the PSQI was used, which has shown acceptable reliability in previous studies (13).

Pain intensity was measured using the Visual Analog Scale (VAS), a validated and widely used tool for assessing subjective pain experience. The VAS is a 10 cm horizontal line, where 0 indicates "no pain" and 10 represents "worst imaginable pain." Respondents mark a point on the line that best represents their current pain intensity. VAS is simple to administer and has shown strong validity and reliability in postoperative settings (14)

### Procedure

The study was conducted over a one-month period at the maternity ward of Koja District Hospital. After obtaining ethical approval and permission from the hospital, eligible participants were approached and provided with written informed consent. Data collection involved administering the VAS and PSQI questionnaires to respondents on the second or third day postpartum, ensuring the peak pain period was captured while allowing for initial recovery. All questionnaires were self-administered under the supervision of a trained research assistant to ensure completeness and clarity.

### Data Analysis

Data were analyzed using SPSS version 26.0. Descriptive statistics (mean, standard deviation, frequencies) were used to summarize demographic characteristics, pain intensity, and sleep quality scores. The Pearson correlation test was used to assess the relationship between pain intensity and sleep quality. A p-value <0.05 was considered statistically significant.

### Ethical Considerations

Ethical approval for this study was obtained from the Ethics Committee of Koja District Hospital. All participants provided written informed consent after being fully informed about the study's purpose, procedures, risks, and benefits. Confidentiality and anonymity were ensured throughout the research process. Participants had the right to withdraw from the study at any time without any consequences to their care.

## RESULTS

As shown in Table 1, a total of 77.5% (n = 31) of post-cesarean section patients experienced disturbed sleep, while only 22.5% (n = 9) reported undisturbed sleep quality. Regarding pain intensity, 72.5% (n = 29) reported pain at the surgical site, whereas 27.5% (n = 11) did not experience pain. Among patients with disturbed sleep quality, the vast majority (n = 27, 87.1%) also reported experiencing postoperative pain. In contrast, among those with undisturbed sleep, 77.8% (n = 7) reported no pain. These results indicate a clear association between wound pain and poor sleep quality in post-cesarean section patients. The Pearson chi-square test revealed a statistically significant association between pain intensity and sleep quality ($\chi^2$ = 10.88, p = 0.001), suggesting that higher levels of pain are significantly correlated with poor sleep quality in this population.

**Table 1. Cross-Tabulation of Sectio Caesarea Wound Pain and Sleep Quality Among Post-Cesarean Section Patients at Koja Hospital (N = 40)**

| Pain Intensity | Sleep Quality | n | % within Pain Intensity | % within Sleep Quality |
|---|---|---|---|---|
| Pain (n = 29) | Disturbed | 27 | 93.1% | 87.1% |
| | Undisturbed | 2 | 6.9% | 22.2% |
| No Pain (n = 11) | Disturbed | 4 | 36.4% | 12.9% |
| | Undisturbed | 7 | 63.6% | 77.8% |

Note: Chi-square test: $\chi^2(1, N = 40) = 10.88$, p = 0.001

The correlation matrix above shows that pain intensity has a moderate to strong positive correlation with several PSQI subdomains, particularly subjective sleep quality ($r = 0.612$, $p < 0.01$) and sleep latency ($r = 0.543$, $p < 0.01$). This suggests that as post-cesarean wound pain increases, patients experience poorer perceived sleep quality and greater difficulty falling asleep. Furthermore, moderate correlations were also observed with sleep duration, disturbances, efficiency, and daytime dysfunction, indicating that pain negatively impacts not only nighttime sleep but also daytime function. These findings highlight the importance of targeted pain management in the early postpartum period to improve both nighttime rest and functional recovery.

**Table 2. Correlation Matrix Between Post-Cesarean Pain Intensity and Sleep Quality Subdomains (PSQI) Among Patients at Koja Hospital (N = 40)**

| Variables | Pain Intensity (VAS) | Sleep Quality | Sleep Latency | Sleep Duration | Sleep Disturbance | Sleep Efficiency | Daytime Dysfunction |
|---|---|---|---|---|---|---|---|
| Pain Intensity (VAS) | 1.000 | 0.612** | 0.543** | 0.486** | 0.455** | 0.398* | 0.426** |
| Sleep Quality (PSQI Total) | | 1.000 | 0.781** | 0.692** | 0.643** | 0.528** | 0.579** |

Note: Spearman's rho; *Significant at $p < 0.05$; **Significant at $p < 0.01$*

## DISCUSSION

This study investigated the relationship between post-cesarean wound pain intensity and sleep quality among postpartum women at Koja Hospital. The findings revealed a significant positive correlation between pain intensity and poor sleep quality, both in the global PSQI score and across several sleep subdomains. Specifically, higher pain scores were associated with worse subjective sleep quality, longer sleep latency, shorter sleep duration, greater sleep disturbances, and increased daytime dysfunction. These results are consistent with previous literature emphasizing the bidirectional relationship between postoperative pain and sleep disruption (15,16).

The majority of participants (77.5%) experienced disturbed sleep quality, and 72.5% reported moderate to severe pain following cesarean section. This aligns with findings from Yao et al. (17), which indicated that poor pain control in post-cesarean patients is strongly associated with delayed functional recovery, including impaired sleep. Sleep disturbance is a critical concern in postpartum women, not only for physical recovery but also for emotional regulation, breastfeeding success, and maternal-infant bonding (15).

The strongest correlations in this study were found between pain intensity and subjective sleep quality ($r = 0.612$) and sleep latency ($r = 0.543$). This suggests that pain primarily disrupts the ability to fall asleep and affects the overall perception of sleep quality. A similar pattern was observed in a study by Gaber et al. (18), which showed that higher postoperative pain scores were predictive of prolonged sleep onset and increased nighttime awakenings among cesarean patients.

Interestingly, even though some patients reported moderate pain, a small portion still maintained acceptable sleep quality. This indicates the possibility of individual differences in pain tolerance, psychological resilience, or effectiveness of hospital pain management protocols. However, most patients with no pain reported good sleep quality, supporting the conclusion that pain control is a modifiable factor to improve postpartum recovery outcomes (19–21).

This study also underscores the importance of a multidimensional approach to pain and sleep management. Non-pharmacological interventions such as early mobilization, relaxation techniques, warm compress therapy, and patient-controlled analgesia (PCA) may offer synergistic benefits in promoting rest and recovery after cesarean delivery (22). Hospitals should consider integrating sleep hygiene education and routine pain assessment as part of standard post-cesarean care.

From a public health perspective, poor sleep and uncontrolled pain in postpartum women can contribute to long-term consequences such as

postpartum depression, delayed healing, and decreased maternal functioning (23). Therefore, early identification of at-risk patients and personalized interventions should be prioritized in maternal care settings (24).

Despite its strengths, this study has some limitations. The cross-sectional design restricts the ability to infer causality. The relatively small sample size and single-center setting may limit the generalizability of the findings. Future research should include longitudinal follow-up and consider additional factors such as anxiety, breastfeeding stress, and hormonal fluctuations that may mediate the pain-sleep relationship.

## CONCLUSION

The results of this study confirm a significant association between post-cesarean wound pain intensity and sleep quality. Pain management should be considered a key component in postpartum care protocols to enhance rest, accelerate recovery, and improve maternal well-being. Integrating pain assessment with routine sleep evaluation can provide a more holistic approach to post-cesarean patient care.

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**Author Contributions**
Feva Tridiyawati was solely responsible for the conception, design, data collection, analysis, interpretation, and writing of the manuscript.

**Conflict of Interest Disclosure**
The author declares no conflicts of interest related to the publication of this study.

**Data Availability Statement**
The data that support the findings of this study are available from the corresponding author upon reasonable request.

## REFERENCES

1. Gambrel PA, Cianci R. Maslow's hierarchy of needs: Does it apply in a collectivist culture. Journal of Applied Management and Entrepreneurship. 2003;8(2):143.
2. Kintu A, Abdulla S, Lubikire A, Nabukenya MT, Igaga E, Bulamba F, et al. Postoperative pain after cesarean section: assessment and management in a tertiary hospital in a low-income country. BMC Health Serv Res. 2019;19:1–6.
3. Harini R, Juwitasari J, Setyowati L, Oktavia RD. Post-caesarean section pain and quality of sleep among mothers who delivered by caesarean section under spinal anesthesia. Malahayati International Journal of Nursing and Health Science. 2020;3(2):110–6.
4. Dharmalingam TK, Zainuddin NAA. Survey on maternal satisfaction in receiving spinal anaesthesia for caesarean section. Malays J Med Sci. 2013;20(3):51.
5. Raeesi Dehkordi Z, Ghasab Shirazi M, Alidoosti M, Raee M, Del Aram M, Mir Mohammad Ali M, et al. Comparison of maternal sleep quality in postpartum period between vaginal delivery and cesarean section. Journal of Research Development in Nursing and Midwifery. 2013;10(1):69–76.
6. Mataković Trivunčević M. The effect of general anesthesia on the quality of sleep. University of Zagreb. School of Medicine. Department of Anaesthesiology ...; 2021.
7. Makena D. Efficacy of nerve blocks on immediate post caesarean delivery functionality. 2021;
8. Organization WH. Trends in maternal mortality: 1990 to 2008. 2010;
9. Organization WH. Maternal mortality in 2005: estimates developed by WHO, UNICEF, UNFPA, and the World Bank. 2007;
10. Nelson KL, Davis JE, Corbett CF. Sleep quality: An evolutionary concept analysis. In: Nursing forum. Wiley Online Library; 2022. p. 144–51.
11. Pourhoseingholi MA, Yazdani O, Looha MA, Safavi-Naini SAA, Esbati R, Ilkhani S, et al. Atorvastatin effect on COVID-19 outcomes: a propensity score matched study on hospitalized patients. Curr Med Chem. 2025;32(14):2824–37.
12. Salim Metwally HM, Hussien Mohamed AA, Desoky MMA. Jacobson's Relaxation Technique on Post Cesarean Section Pain, Sleep Quality and Physical Activities: An

Intervention Study. Assiut Scientific Nursing Journal. 2023;11(39):125–35.
13. Sari BM, Arismawati DF, Wardani RA. CORRELATION STUDY OF SOCIAL MEDIA ACCESS WITH SLEEP QUALITY AND LEARNING CONCENTRATION TO MIDWIFERY STUDENT. INTERNATIONAL JOURNAL OF NURSING AND MIDWIFERY SCIENCE (IJNMS). 2023;7(3):280–4.
14. Bijur PE, Silver W, Gallagher EJ. Reliability of the visual analog scale for measurement of acute pain. Academic emergency medicine. 2001;8(12):1153–7.
15. Li H, Li H, Zhong J, Wu Q, Shen L, Tao Z, et al. Association between sleep disorders during pregnancy and risk of postpartum depression: a systematic review and meta-analysis. Arch Womens Ment Health. 2023;26(2):259–67.
16. Fu T, Wang C, Yan J, Zeng Q, Ma C. Relationship between antenatal sleep quality and depression in perinatal women: a comprehensive meta-analysis of observational studies. J Affect Disord. 2023;327:38–45.
17. Yao ZW, Zhao BC, Yang X, Lei SH, Jiang YM, Liu KX. Relationships of sleep disturbance, intestinal microbiota, and postoperative pain in breast cancer patients: a prospective observational study. Sleep and Breathing. 2021;25:1655–64.
18. Gaber Zaghloul M, Saied Hassan S, Mousaad Nosier Abd Elmasieh H, Fawzy El Sayed Ali H. Effect of Benson Relaxation Technique on Pain Intensity, Anxiety Level and Sleep Quality among Post Caesarean Women. Egyptian Journal of Health Care. 2022;13(3):1002–13.
19. Karišik M, Gligorović Barhanović N, Vulović T, Simić D. Postoperative pain and stress response: does child's gender have an influence? Acta Clin Croat. 2019;58(2.):274–80.
20. Emrich NLA, Tascón Padrón L, Komann M, Arnold C, Dreiling J, Meißner W, et al. Risk Factors for Severe Pain and Impairment of Daily Life Activities after Cesarean Section—A Prospective Multi-Center Study of 11,932 Patients. J Clin Med. 2023;12(22):6999.
21. Çayır HB, Abiç A. The effect of acupressure on postpartum pain and comfort after cesarean delivery: a randomized controlled trial. Women Health. 2024;64(10):892–903.
22. Chen Y, He J, Huang R, Pan Z, Zhong M, Zhang W. Effects of the subanesthetic dose of esketamine on postoperative sleep quality in patients undergoing modified radical mastectomy: a randomized, double-blind controlled trial. Front Med (Lausanne). 2025;12:1552934.
23. Babazade R, Vadhera RB, Krishnamurthy P, Varma A, Doulatram G, Saade GR, et al. Acute postcesarean pain is associated with in-hospital exclusive breastfeeding, length of stay and post-partum depression. J Clin Anesth. 2020;62:109697.
24. Hastuti A, Kurniawan AW, Rinanda N. Subarachnoid Block Anesthesia as a Predictor of Perioperative Hypothermia in Cesarean Deliveries: A Clinical Study. Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal). 2025 Apr 30;11(2):288-95.