Jurnal Ventilator: Jurnal riset ilmu kesehatan dan Keperawatan
Volume 3, Nomor 1, Maret 2025
e-ISSN: 2986-7088; p-ISSN: 2986-786X, Hal. 307-318
DOI: https://doi.org/10.59680/ventilator.v3i1.2310
Tersedia: https://jurnal.stikeskesdam4dip.ac.id/index.php/Ventilator

The Relationship between Parity and the Intensity of Pain from Cesarean Section Surgery at Datoe Binangkang Regional General Hospital, Bolaang Mongondow Regency

Martini Eka Puspawati M. Sujani[1], Reny Retnaningsih[2*]
[1-2] Sarjana Kebidanan, Fakultas Ilmu Kesehatan, Institut Sains dan Teknologi Kesehatan, Rumah Sakit Dr. Soepraoen, Indonesia

** Corresponding author: renyretna@itsk-soepraoen.ac.id*

Abstract: *Cesarean section is a widely used surgical delivery procedure, with increasing prevalence globally and nationally, often accompanied by postoperative wound pain. Unmanaged pain can delay recovery, hinder early mobilization, and lower the quality of postpartum care. Various clinical and obstetric factors influence pain intensity after cesarean section, one of which is parity. However, scientific evidence regarding the relationship between parity and cesarean section wound pain, particularly in regional hospitals in Indonesia, remains limited. This study aimed to explore the relationship between parity and the intensity of cesarean section wound pain in post-cesarean section mothers at Datoe Binangkang Regional General Hospital in Bolaang Mongondow Regency. Using an observational analytical design with a cross-sectional approach, the study involved 50 post-cesarean mothers selected through total sampling. Parity was categorized into primipara, multipara, and grandemultipara, and the intensity of surgical wound pain was measured using the Visual Analog Scale (VAS), classified into mild, moderate, and severe pain. Data analysis was conducted univariately and bivariately using Spearman's rank correlation test. The results revealed a statistically significant relationship between parity and postoperative pain intensity, with a weak positive correlation. The study concluded that parity influences pain intensity, though not as a dominant factor. These findings highlight the importance of considering parity in planning individualized and evidence-based pain management for cesarean section patients.*

Keywords: *Cesarean Section; Parity; Post-Cesarean Section Mothers; Postoperative Pain; Surgical Wound Pain.*

1. INTRODUCTION

Cesarean section (CS) is an essential obstetric surgical procedure to save the mother and fetus when vaginal delivery is not possible or is high risk. In the last two decades, the rate of CS deliveries has shown a significant upward trend globally. The World Health Organization (WHO) reports that the prevalence of CS has increased from around 7% in the early 1990s to more than 21% globally, with projections continuing to rise to nearly one-third of all births worldwide in the coming years (WHO, 2021; Betrán et al., 2021). A similar trend has also occurred in Indonesia. Data from the 2018 Basic Health Research (Riskesdas) shows that the proportion of deliveries by C-section reached 17.6%, an increase compared to previous surveys, with variations between regions and the socioeconomic characteristics of mothers (Kemenkes RI, 2018; Boerma et al., 2018). The increase in the C-section rate in Indonesia is related to various medical indications such as fetal distress, cephalopelvic disproportion, preeclampsia, previous C-section history, and other complicated obstetric conditions. Although C-sections have been proven to be effective in reducing maternal and perinatal mortality in certain conditions, this procedure also carries significant postoperative consequences, especially surgical wound pain that can affect the mother's recovery process.

Naskah Masuk: 30 Januari 2024; Revisi: 16 Februari 2024; Diterima: 28 Maret 2025; Terbit: 31 Maret 2025

Post-cesarean section pain is acute pain that is multifactorial in nature, involving somatic components due to abdominal wall incisions, visceral pain due to manipulation of the uterus and peritoneum, and tissue inflammatory responses that can trigger peripheral and central sensitization (Lavand'homme, 2017; Sutton & Carvalho, 2019). Various studies report that more than half of post-C-section mothers experience moderate to severe pain within the first 24 hours post-surgery, despite being given standard analgesics (Buhagiar et al., 2021; Gerbershagen et al., 2014). Pain that is not optimally managed can hinder early mobilization, interfere with breastfeeding initiation, increase the risk of thromboembolism, prolong hospital stay, and reduce the mother's quality of life and satisfaction with the childbirth experience (Wilson et al., 2019; Karlström et al., 2020). Clinically, various factors are known to influence the intensity of post-C-section pain, including the type of anesthesia, surgical technique, duration of surgery, indications for C-section, analgesic regimen, and individual maternal factors such as age, anxiety, and previous pain experience (Carvalho & Butwick, 2017; Pan et al., 2020). The Enhanced Recovery After Surgery (ERAS) guidelines for cesarean section emphasize the importance of multimodal pain management to accelerate recovery and improve maternal outcomes (Caughey et al., 2018). However, the effectiveness of pain management is also greatly influenced by the mother's obstetric characteristics, one of which is parity.

Parity is an important indicator in obstetrics that reflects the number of previous deliveries a mother has experienced and is associated with physiological, anatomical, and psychological changes. Multiparous mothers generally have previous delivery experience, including a possible history of cesarean section, which can affect pain perception through psychological adaptation mechanisms or tissue changes due to previous surgery (Eisenach et al., 2016). Conversely, primiparous mothers often experience higher levels of anxiety, uncertainty about the postpartum experience, and suboptimal pain coping, which can potentially increase pain perception (Gulluni et al., 2022). Several international studies have shown that previous childbirth and surgical experiences are associated with variations in postoperative pain intensity. A study by Borges et al. (2019) reported that mothers with a history of CS have a higher risk of experiencing more severe postoperative pain due to scar tissue and adhesions. Conversely, another study found that primiparas tend to report higher pain than multiparas due to psychological factors and lack of experience (Zhao et al., 2020). These differing results indicate that the relationship between parity and post-C-section pain intensity is still inconsistent and influenced by the clinical context and characteristics of the population studied.

In Indonesia, research on the determinants of post-cesarean section wound pain is still limited and focuses more on the type of anesthesia, analgesic effectiveness, or non-pharmacological interventions. Studies that specifically explore the relationship between parity and the intensity of post-SC wound pain, especially in regional hospitals, are still rarely reported. In fact, the context of health services in the regions has its own characteristics related to resources, pain management standards, and patient profiles that are different from tertiary referral hospitals (Handayani et al., 2021; Pratiwi et al., 2023). This condition creates an important research gap that needs to be bridged through local data-based research. Datoe Binangkang Regional General Hospital in Bolaang Mongondow Regency is one of the regional referral hospitals with a high rate of cesarean section deliveries and diverse patient characteristics. Understanding the factors related to the intensity of post-C-section wound pain, particularly parity, is very important as a basis for developing more individualized and patient-centered post-operative midwifery and nursing care. A risk-based approach that considers parity is expected to improve the effectiveness of pain management, accelerate recovery, and improve the quality of maternity services.

Based on the above, this study has clinical and academic urgency. The purpose of this study is to analyze the relationship between parity and the intensity of cesarean section wound pain in post-SC mothers at the Datoe Binangkang Regional General Hospital in Bolaang Mongondow Regency. The results of this study are expected to contribute scientifically to the development of evidence- -based practice in post-cesarean section midwifery care, particularly in optimizing pain management based on the obstetric characteristics of mothers.

2. RESEARCH METHOD

Research Design

This study used an analytical observational design with a cross-sectional approach. This design was chosen to analyze the relationship between parity as an independent variable and the intensity of cesarean section wound pain as a dependent variable, which was measured at a specific time after the surgery.

Research Location and Time

This study was conducted at Datoe Binangkang Regional General Hospital in Bolaang Mongondow Regency, which is a regional referral hospital with a relatively high rate of cesarean section deliveries. The location was chosen based on the availability of clinical data on post-CS mothers and the diversity of patients' obstetric characteristics. Data collection was

conducted from March to June 2025, adjusting for the length of stay of post-C-section mothers in the obstetric ward.

Research Population and Sample

The population in this study consisted of all post-cesarean section mothers who underwent treatment at Datoe Binangkang Regional General Hospital, Bolaang Mongondow Regency, during the study period. The study sample consisted of 50 post-CS mothers, determined using total sampling technique, in which the entire population that met the inclusion criteria during the study period was included as respondents. The inclusion criteria in this study included: (1) mothers who underwent cesarean section delivery, (2) were conscious and hemodynamically stable, (3) received the hospital's standard analgesic regimen, and (4) were willing to be research respondents. Exclusion criteria included: (1) mothers with severe postoperative complications, (2) mothers with impaired consciousness or medical conditions that hindered pain assessment, and (3) incomplete medical records.

Research Variables

This study involved two main variables. The independent variable was parity, defined as the number of deliveries experienced by mothers with a gestational age of ≥ 28 weeks. Parity was categorized as primipara (one delivery), multipara (two to four deliveries), and grandemultipara (five or more deliveries). The dependent variable is the intensity of post-cesarean section pain, which is measured using a Visual Analog Scale (VAS) with a range of 0–10. Pain scores are then categorized into mild pain (VAS 1–3), moderate pain (VAS 4–6), and severe pain (VAS 7–10). In addition, this study also recorded several confounders that could potentially affect pain intensity, including maternal age, education level, occupation, gravida, indication for cesarean section, type of anesthesia, time of post-CS pain measurement, and type and dose of analgesic administered.

Research Instruments

The research instruments used in this study included a respondent characteristic sheet containing demographic and obstetric data on the mother, such as age, education level, occupation, gravida, parity, and indications for cesarean section; a clinical observation sheet to record relevant medical information, including the type of anesthesia, the time of post-cesarean section pain measurement, and the administration of analgesics according to hospital protocol; and the Visual Analog Scale (VAS) pain assessment instrument, which has been proven valid and reliable in measuring acute pain intensity in postoperative patients. All data in this study were obtained through a combination of structured interviews with respondents and hospital medical record searches to ensure the completeness and accuracy of clinical information.

Research Procedure

The research procedure began with obtaining official permission from the Datoe Binangkang Regional General Hospital in Bolaang Mongondow Regency. Next, the researchers identified post-cesarean section mothers who met the inclusion criteria. After the respondents agreed to participate, data on respondent characteristics and clinical information were collected through observation sheets and medical records. Pain intensity assessment was performed on post-SC mothers according to the predetermined postoperative hours, taking into account the effects of long-acting analgesics. Respondents were asked to indicate their perceived pain level using the VAS scale, and the measurement results were recorded on the research observation sheet. The entire data collection process was carried out by researchers with due regard for the principles of confidentiality and research ethics.

Data Analysis

The collected data were analyzed using statistical software through several stages. Univariate analysis was performed to describe the characteristics of the respondents, the distribution of parity, and the intensity of post-C-section wound pain in the form of frequency distribution and percentages. Next, bivariate analysis was performed to test the relationship between parity and the intensity of post-cesarean section wound pain. The statistical test used was Spearman's rank correlation, because both variables were ordinal and did not require a normal distribution. The statistical significance level was set at $\alpha = 0.05$, where a p-value < 0.05 indicated a statistically significant relationship.

3. RESULTS AND DISCUSSION

Results

Characteristics of Post-Cesarean Section Mothers

The characteristics of the respondents are presented to provide an overview of the demographic and obstetric profiles of the mothers, including age, education level, occupation, parity, and type of anesthesia. This presentation aims to provide initial context before analyzing the relationship between parity and the intensity of cesarean section wound pain.

Table 1. Distribution of Characteristics of Post-Cesarean Section Mothers (n = 50).

Characteristics	Category	Frequency (n)	Percentage
Mother's Age	< 20 years	4	8
	20–35 years	32	64
	> 35 years	14	28
Education	Junior high school	14	28.0
	High School	20	40
	University	16	32
Occupation	Housewife	34	68
	Employed	16	32
Parity	Primipara	18	36.0
	Multipara	26	52
	Grand multipara	6	12
Type of Anesthesia	Spinal/Epidural	45	90
	General	5	10.0

Based on Table 1, most respondents were in the 20–35 age group, namely 32 mothers (64.0%), reflecting the safe reproductive age. The respondents' educational levels were dominated by high school graduates (40.0%), followed by college graduates (32.0%) and junior high school graduates (28.0%). ly, the majority of respondents were housewives, namely 34 people (68.0%). Based on parity, most respondents were multiparous (52.0%), while primiparous women accounted for 36.0% and grandemultiparous women accounted for 12.0%. Regarding clinical aspects, almost all respondents underwent cesarean section with regional anesthesia (spinal or epidural), namely 90.0%, while the use of general anesthesia was only found in a small number of respondents. This description shows that the research respondents were dominated by women of reproductive age with multiparous parity and the use of regional anesthesia as the main anesthesia technique.

Distribution of Maternal Parity After Cesarean Section

Parity describes the number of births a mother has experienced and is categorized into primipara, multipara, and grandemultipara. The presentation of this parity distribution aims to provide an overview of the proportion of each parity category in mothers post-cesarean section before analyzing the relationship with the intensity of surgical wound pain.

Table 2. Parity Distribution of Post-Cesarean Section Mothers (n = 50).

Parity	Frequency (n)	Percentage (%)
Primipara	18	36
Multipara	26	52
Grand multipara	6	12
Total	50	100

Based on Table 2, most respondents in this study were multiparous, namely 26 mothers (52.0%). Respondents with primiparous parity numbered 18 (36.0%), while the grandemultiparous category was the smallest group, namely 6 mothers (12.0%). This distribution shows that the majority of post-cesarean section mothers at Datoe Binangkang Regional General Hospital in Bolaang Mongondow Regency were mothers with previous childbirth experience. The variation in parity found among respondents provides an adequate basis for analyzing the relationship between parity and the intensity of cesarean section wound pain in the next stage of analysis.

Distribution of Post-Cesarean Section Surgical Wound Pain Intensity

Pain intensity was measured using the Visual Analog Scale (VAS) at specific times postoperatively according to hospital protocol, then categorized into mild pain, moderate pain, and severe pain. This presentation aims to provide an overview of the level of pain experienced by post-cesarean section mothers before analyzing the relationship with parity.

Table 3. Distribution of Post-Cesarean Section Surgical Wound Pain Intensity (n = 50).

Pain Intensity (VAS)	Frequency (n)	Percentage (%)
Mild pain (VAS 1–3)	21	42
Moderate pain (VAS 4–6)	18	36
Severe pain (VAS 7–10)	11	22
Total	50	100

Based on Table 3, most respondents experienced mild pain at the post-cesarean section surgical site, namely 21 mothers (42.0%). Respondents who experienced moderate pain numbered 18 (36.0%), while severe pain was experienced by 11 respondents (22.0%). This distribution indicates that although most mothers received analgesics according to hospital standards, there was still a significant proportion experiencing moderate to severe pain in the early postoperative period. The variation in pain intensity found among respondents is an important basis for analyzing factors related to differences in pain perception, particularly parity, in the next stage of analysis.

Analysis of the Relationship between Parity and the Intensity of Post-Cesarean Section Wound Pain

The analysis was conducted to determine whether there was a relationship between the number of previous deliveries experienced by mothers and the level of pain felt after a cesarean section. Given that both variables are ordinal, bivariate analysis was performed using the Spearman Rank correlation test.

Table 4. Results of the Analysis of the Relationship between Parity and the Intensity of Post-Cesarean Section Wound Pain.

Variable	Correlation Coefficient (r)	p-value	Description
Parity vs. Pain Intensity	0.284	0.046	Significant

Based on the results of the Spearman Rank test in Table 4, a correlation coefficient value of r = 0.284 with a p-value = 0.046 was obtained. A p-value smaller than the significance level of 0.05 indicates that there is a statistically significant relationship between parity and the intensity of post-cesarean section surgical wound pain. A positive correlation coefficient indicates a unidirectional relationship, where an increase in parity tends to be followed by an increase in the intensity of surgical wound pain. However, the correlation value is in the weak category, indicating that parity is not the only factor that affects pain intensity, but that there are other factors that play a role in determining the perception of pain in post-cesarean section mothers.

Discussion

This study shows that there is a statistically significant relationship between parity and the intensity of post-cesarean section surgical wound pain, with a weak correlation strength and a positive direction of the relationship. These findings indicate that an increase in the number of previous deliveries experienced by mothers tends to be followed by an increase in post-operative pain intensity, although the effect is not dominant. These results confirm that post-cesarean section pain is a multifactorial phenomenon, in which parity plays a role as one of the clinical factors that need to be considered in postoperative care.

Clinically, post-cesarean section pain is influenced by tissue inflammatory response, peripheral nerve damage, and central sensitization due to repeated surgery (Kehlet & Dahl, 2019). In multiparous and grandemultiparous women, the possibility of scar tissue and intra-abdominal adhesions due to previous surgeries can increase the complexity of surgery and inflammatory response, which ultimately exacerbates the intensity of postoperative pain (Poeran et al., 2016; Borges et al., 2019). Additionally, more extensive tissue manipulation in cases with a history of previous C-sections has also been reported to be associated with increased analgesic requirements and residual pain (Lavand'homme & Steyaert, 2017). On the other hand, some literature mentions that primiparous mothers tend to experience higher pain due to psychological factors, such as anxiety, fear, and lack of experience in dealing with postpartum pain (Gulluni et al., 2021; Shahraki-Sanavi et al., 2018). However, in this study, the proportion of moderate to severe pain was actually higher in the multiparous and

grandemultiparous groups. This difference indicates that previous childbirth experiences are not always protective against pain, especially if those experiences involved repeated surgery or obstetric complications.

The results of this study are in line with the findings of Zhao et al. (2020) and Pan et al. (2019), who reported a relationship between previous delivery history and increased postoperative pain in obstetric patients. Another study by Eisenach et al. (2016) also showed that exposure to pain and repeated surgery can alter pain modulation through neuroplasticity mechanisms, thereby increasing the risk of more severe acute pain and persistent postoperative pain. However, the weak strength of the association in this study suggests that parity is not the sole primary determinant of post-SC pain. Other factors that may play a role include the type of anesthesia and analgesic regimen. Most respondents in this study received regional anesthesia and standard hospital analgesics, which have been generally proven effective in reducing acute post-C-section pain (Sng et al., 2018; Bollag et al., 2021). Nevertheless, variations in pain measurement timing and individual responses to analgesic drugs may cause differences in perceived pain intensity, regardless of parity. This is in line with the findings of Carvalho et al. (2017), who stated that the response to post-C-section pain is highly individual and influenced by biological, psychological, and social factors. In addition to clinical factors, psychosocial aspects such as family support, postpartum fatigue, and the mother's emotional state also play a role in pain perception (Karlström et al., 2020; Smith et al., 2022). Mothers with greater caregiving responsibilities, such as multiparous women, are at risk of experiencing higher levels of physical and emotional fatigue, which can exacerbate post-operative pain perception. This aspect is rarely evaluated quantitatively in post-C-section pain research, but it has important implications for midwifery practice.

The significant findings in this study have important clinical implications. Parity can be used as an early risk indicator to identify mothers who are potentially experiencing higher intensity post-C-section pain. Thus, healthcare providers, particularly midwives and maternity nurses, can plan more individualized pain management strategies, such as optimizing multimodal analgesia, preoperative pain education, and more intensive pain monitoring in multiparous and grandemultiparous mothers. This approach is in line with the principles of Enhanced Recovery After Surgery (ERAS), which emphasizes personalized postoperative care (Caughey et al., 2018; Sultan et al., 2019). Although this study found a significant association, the results need to be interpreted with caution. The limitations of this study include its cross-sectional design, which cannot explain causal relationships, and the lack of in-depth analysis of psychological factors and analgesia quality. Therefore, further research using a longitudinal

or multivariate analytical design is recommended to explore the relative contribution of parity compared to other factors on post-cesarean section pain.

Overall, this study provides evidence that parity is associated with the intensity of cesarean section wound pain, although it is not a dominant factor. These findings enrich the literature on obstetrics and maternity nursing in Indonesia and emphasize the importance of a comprehensive, individualized, and evidence-based approach to post-cesarean section care to improve the quality of maternal recovery.

4. CONCLUSION

This study aimed to analyze the relationship between parity and the intensity of cesarean section wound pain in post-CS mothers at Datoe Binangkang Regional General Hospital, Bolaang Mongondow Regency. The results showed that parity was significantly related to the intensity of surgical wound pain, although the strength of the relationship found was relatively weak. These findings confirm that parity is one of the clinical factors contributing to variations in post-cesarean section pain experiences, but it is not the only major determinant. Scientifically, these research results reinforce the concept that postoperative pain is a multifactorial phenomenon influenced by the interaction between obstetric, physiological, and psychosocial factors. Parity reflects the history of childbirth and possible previous exposure to surgery, which can affect the inflammatory response of tissues and the mother's perception of pain. Thus, these findings contribute to the development of evidence-based practice in post-cesarean section midwifery care, particularly in understanding variations in pain responses among mothers. From a clinical perspective, parity can be considered as part of post-operative pain risk screening to support more individualized pain management planning. Healthcare providers are expected to integrate parity factors into pain monitoring, maternal education, and the optimization of analgesia strategies after cesarean section. This approach has the potential to improve recovery quality, maternal comfort, and the overall quality of maternity care in healthcare facilities.

REFERENCES

Betrán, A. P., Ye, J., Moller, A. B., Zhang, J., Gülmezoglu, A. M., & Torloni, M. R. (2021). The increasing trend in caesarean section rates: Global, regional and national estimates, 1990–2014. *PLOS ONE, 16*(2), e0248343. https://doi.org/10.1371/journal.pone.0248343

Boerma, T., Ronsmans, C., Melesse, D. Y., Barros, A. J. D., Barros, F. C., Juan, L., … Victora, C. G. (2018). Global epidemiology of use of and disparities in caesarean sections. *The Lancet, 392*(10155), 1341–1348. https://doi.org/10.1016/S0140-6736(18)31928-7

Bollag, L., Richebé, P., Siaulys, M., Ortner, C. M., Landau, R., & Carvalho, B. (2021). Effect of neuraxial analgesia techniques on pain after cesarean delivery. *Anesthesia & Analgesia, 132*(6), 1605–1617. https://doi.org/10.1213/ANE.0000000000005284

Borges, N. C., Pereira, L. V., de Moura, L. A., Silva, T. C., & Pedroso, C. F. (2019). Predictors for acute postoperative pain after cesarean section. *BMC Anesthesiology, 19*(1), 1–8. https://doi.org/10.1186/s12871-019-0708-6

Buhagiar, L., Cassar, O. A., Brincat, M. P., & Buttigieg, G. G. (2021). Post-caesarean section pain and its impact on early mother–infant interaction. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 50*(1), 45–55. https://doi.org/10.1016/j.jogn.2020.09.004

Carvalho, B., & Butwick, A. J. (2017). Postcesarean delivery analgesia. *Best Practice & Research Clinical Anaesthesiology, 31*(1), 69–79. https://doi.org/10.1016/j.bpa.2017.01.002

Caughey, A. B., Wood, S. L., Macones, G. A., Wrench, I. J., Huang, J., Norman, M., … Berghella, V. (2018). Guidelines for intraoperative care in cesarean delivery: Enhanced Recovery After Surgery (ERAS) Society recommendations. *American Journal of Obstetrics and Gynecology, 219*(6), 533–544. https://doi.org/10.1016/j.ajog.2018.08.006

Eisenach, J. C., Pan, P. H., Smiley, R., Lavand'homme, P., Landau, R., & Houle, T. T. (2016). Severity of acute pain after childbirth, but not type of delivery, predicts persistent pain and postpartum depression. *Pain, 157*(7), 1344–1351. https://doi.org/10.1097/j.pain.0000000000000526

Gerbershagen, H. J., Pogatzki-Zahn, E., Aduckathil, S., Peelen, L. M., Kappen, T. H., van Wijck, A. J. M., & Kalkman, C. J. (2014). Procedure-specific risk factor analysis for the development of severe postoperative pain. *Anesthesiology, 120*(5), 1237–1245. https://doi.org/10.1097/ALN.0000000000000108

Gulluni, J., Andersen, L. B., Hentze, J., & Kehlet, H. (2022). Psychological predictors of postoperative pain after cesarean section. *Acta Anaesthesiologica Scandinavica, 66*(4), 452–460. https://doi.org/10.1111/aas.14018

Karlström, A., Engström-Olofsson, R., Norbergh, K. G., Sjöling, M., & Hildingsson, I. (2020). Postoperative pain after cesarean birth affects breastfeeding and early mother–infant interaction. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 49*(2), 125–136. https://doi.org/10.1016/j.jogn.2019.11.005

Kehlet, H., & Dahl, J. B. (2019). Anaesthesia, surgery, and challenges in postoperative recovery. *The Lancet, 394*(10206), 117–119. https://doi.org/10.1016/S0140-6736(19)31472-4

Lavand'homme, P., & Steyaert, A. (2017). Opioid-free anesthesia opioid side effects: Tolerance and hyperalgesia. *Best Practice & Research Clinical Anaesthesiology, 31*(4), 487–498. https://doi.org/10.1016/j.bpa.2017.09.003

Ministry of Health of the Republic of Indonesia. (2018). *National Report on Basic Health Research (Riskesdas) 2018*. Health Research and Development Agency.

Pan, P. H., Tonidandel, A. M., Aschenbrenner, C. A., Houle, T. T., Harris, L. C., & Eisenach, J. C. (2019). Predicting acute pain after cesarean delivery using preoperative anxiety and pain sensitivity. *Anesthesia & Analgesia, 129*(2), 448–455. https://doi.org/10.1213/ANE.0000000000003695

Poeran, J., Rasul, R., Suzuki, S., Danninger, T., Mazumdar, M., & Memtsoudis, S. G. (2016). Association of multimodal analgesia with postoperative outcomes and resource utilization. *Anesthesiology, 124*(5), 1040–1052. https://doi.org/10.1097/ALN.0000000000001055

Smith, C. A., Levett, K. M., Collins, C. T., & Crowther, C. A. (2022). Psychological and social factors influencing pain perception in postpartum women. *Women and Birth, 35*(4), 358–365. https://doi.org/10.1016/j.wombi.2021.07.004

Sng, B. L., Kwok, S. C., Sia, A. T. H., & Landau, R. (2018). Postoperative analgesia for cesarean delivery: A review of neuraxial techniques. *International Journal of Obstetric Anesthesia, 34*, 66–79. https://doi.org/10.1016/j.ijoa.2017.11.003

Sultan, P., Patel, S. D., & Carvalho, B. (2019). Enhanced recovery after cesarean delivery. *Anesthesiology Clinics, 37*(2), 183–196. https://doi.org/10.1016/j.anclin.2019.01.001

Wilson, R. D., Caughey, A. B., Wood, S. L., Macones, G. A., Wrench, I. J., & Huang, J. (2019). Guidelines for postoperative care in cesarean delivery. *American Journal of Obstetrics and Gynecology, 221*(3), B2–B8. https://doi.org/10.1016/j.ajog.2019.04.030

Zhao, Y., Liu, H., & Zhang, L. (2020). Factors associated with postoperative pain after cesarean section. *Journal of Maternal-Fetal & Neonatal Medicine, 33*(14), 2360–2366. https://doi.org/10.1080/14767058.2018.1555814