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Postoperative pain experience in post caesarean section mothers in developing countries: A scoping review

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ABSTRACT

Background: The increase in the number of global caesarean sections highlights the importance of understanding the postoperative pain experience as well as the factors that influence patient experience after this procedure

Objectives: The aim of this scoping review was to identify the best evidence of pain experience in post-sectio caesarean mothers, evaluate the factors that influence patients' experiences of pain after caesarean sections, and identify barriers to dealing with postoperative pain.

Methods: Databases were searched from 2019 to 2023 from various databases, including PubMed, ScienceDirect, and Wiley. As well as using search engines such as Google Scholar and Research Rabbit and selecting them using Mendeley assistance. Critical appraisal and data charting are adopted from the JBI checklist, including cross-sectional, cohort, RCT, and quasi-experimental JBI. Of the 870 articles identified, only nine met the criteria.

Results: The results of this review identified three themes, including supporting and inhibiting factors for pain management efforts, the implications of post-sectio cesarean pain, and patient characteristics.

Conclusions: Health professionals are advised to implement holistic, evidence-based post-cesarean pain management by combining pharmacological and non-pharmacological methods, supported by improved preoperative education and strict monitoring of analgesic use. An individualized approach and further follow-up studies are essential to optimize maternal recovery and long-term quality of life.

1. Introduction

Caesarean section is an effective surgical procedure to reduce the risk of maternal and infant mortality when performed based on clear medical indications. However, caesarean section rates continue to increase globally with no significant benefits seen for maternal or newborn health (Garba, Jamilah, et al., 2021). Instead, this increase may increase the risk of morbidity for both mother and baby. Caesarean delivery is known to be associated with short- and long-term risks that can impact for years after delivery, affecting the health of the mother, child and future pregnancies. High rates of caesarean section are also associated with high healthcare costs (WHO, 2018).

According to a recent study from the World Health Organization (WHO), the global use of caesarean sections continues to increase, currently accounting for more than 1 in 5 deliveries (21%). Projections show that this number is expected to continue to rise in the coming decade, with nearly one-third (29%) of all births predicted to be by caesarean section by 2030, according to the study's findings (WHO, 2021). Based on data from 12 million pregnancies analyzed, maternal mortality after

caesarean section in low- and middle-income countries is 100 times higher than in high-income countries. A recent review that included 196 studies from 67 low- and middle-income countries, published in The Lancet, highlighted this issue. As many as one-third of infants were also reported to die in this condition. In low- and middle-income countries, the risk of stillbirth and perinatal mortality tends to be higher. The overall stillbirth rate in babies born by caesarean section stands at 56.6 per 1000 operations, with the highest rate recorded in sub-Saharan Africa (82.5 per 1000). Meanwhile, the perinatal mortality rate reached 84.7 per 1000 caesarean sections globally, with the highest rate recorded in the Middle East and North Africa (354.6 per 1000), followed by sub-Saharan Africa (100.4 per 1000)

Although caesarean section plays a crucial role in saving lives, the decision to perform this surgery without a clear medical indication can increase the risk of short- and long-term health problems for both mother and baby that could have been avoided. Patients undergoing caesarean section often experience pain, especially after the postoperative anesthesia wears off. This pain can interfere with the emotional connection between mother and baby, make daily activities difficult, restrict body movement, delay the use of breast milk, and potentially affect the initial process of breastfeeding after cesarean section which can ultimately affect the health of the newborn baby (Maulani et al., 2021).

Patients' experiences after caesarean section vary and are influenced by several factors including good preparation before surgery, including adequate information and strong social support, tends to increase patients' positive experiences (Bohren et al., 2019). A smooth and uncomplicated surgical process also contributes to a positive experience. In addition, a quick and trouble-free postoperative recovery is another factor that influences patients' positive experience. This study confirms that it is important for health professionals to provide adequate information and social support to patients before undergoing caesarean section. Education about the postoperative recovery process as well as pain management and other complications also needs to be provided so that patients can face this process better (Yugistyowati & Anafrin, 2013).

The aim of this scoping review is to identify the best evidence of pain experience in post sectio caesarean mothers, evaluate the factors that influence the experience of patients after caesarean section in dealing with pain, and to identify barriers in dealing with postoperative pain.

2. Method

This review examines the experience of dealing with postoperative pain in post sectio caesarean mothers. This review uses a type of scoping review, which is a form of systematic knowledge synthesis that applies a systematic approach to map evidence related to a topic, as well as identifying key concepts, theories, sources and knowledge gaps. Although scoping reviews have been widely conducted, there is a need to improve their methodological quality and presentation. This document introduces the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) guidelines along with their explanation (Tricco et al., 2018). This scoping review method adopted the approach developed by Arksey & O'Malley (2005) the steps followed in this scoping review include: (1) identifying the research question, (2) identifying relevant studies, (3) selecting appropriate studies, (4) mapping the data from the selected studies, and (5) systematically compiling, summarizing, and reporting the results.

2.1 Identifying Research Questions

Scoping review question based on PEOS framework table 1 "How do postoperative mothers cope with pain in developing countries?" Specific keywords are listed in table 2.

Table 1. PEOS Framework

P (Population)	E (Exposure)	O (Outcome)	S (Study Design)
Postpartum mothers	Sectio Caesarea	Pain	Qualitative, Quantitative, mixed methods

Literature selection was carried out using PubMed, ScienceDirect, and Wiley databases. As well as using search engines such as Google Scholar and Research Rabbit. The search for articles using the keywords used was limited to postpartum OR postnatal AND pain relief OR self-care OR pain

management AND post caesarean sectio OR Caesarean Surgery. Specific keywords were used in each database.

Table 2. Keywords

Variables	Indonesian
Postpartum mother	Ibu Nifas
Pain	Ibu Pospartu
Caesarean Section	Nyeri
	Operasi Caesar

The inclusion and exclusion criteria used in this review are as follows:

Table 3. Inclusion and Exclusion Criteria

No.	Component	Discussion
1	Inclusion Criteria	1 Articles published from 2019 to 2023. 2 Articles in English and Indonesian 3 Articles on Developing Countries 4 Open Access articles
2	Exclusion Criteria	Systematic reviews, case reports, conference info, conference abstracts

2.1 Identifying Relevant Studies

After conducting a literature search using predetermined keywords in several databases and manual search engines, researchers identified 891 articles. These articles were then screened to select those relevant to the review topic, and after the screening process, 11 articles were found to meet the set criteria. At this stage, we used the Prisma Flow Chart to systematically illustrate the article selection process.

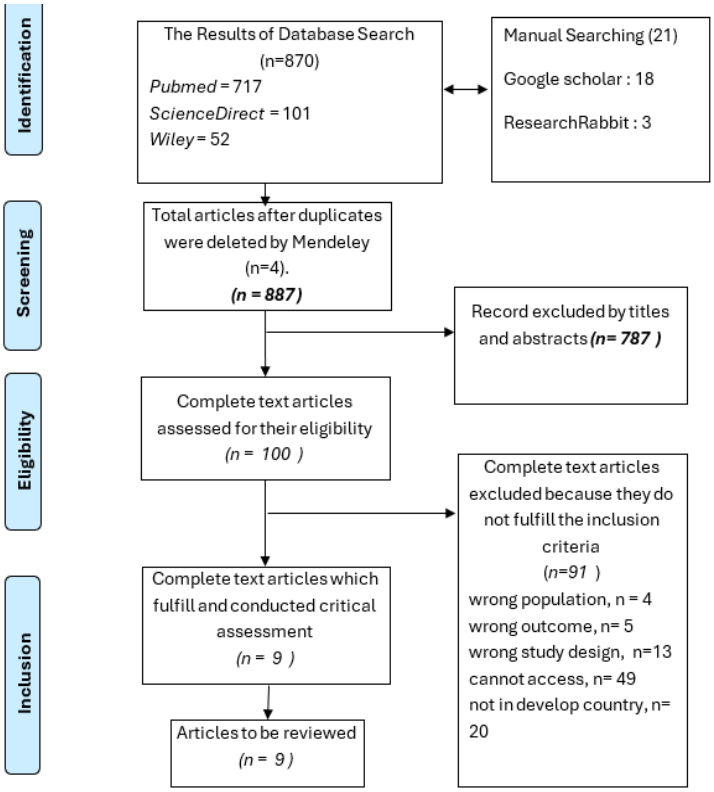

Fig. 1. Flowchart Prism

3. Result and Discussion

The extracted data included data relevant to the topic of the experience of dealing with postoperative pain in post sectio caesarean mothers, the instruments used, the country of origin of the study, the purpose of the study, the research design, the participants, the sampling sample, and the results of the study (shown in table 4).

Table 4. Data Charting

Study ID/Title/Purpose/Design/Country/Author Name and Year of Publication	Inclusion and exclusion criteria	Sampling Method	Sample Characteristics	Data collection and analysis	Results
A1/ **Postoperative pain after cesarean section: assessment and management in a tertiary hospital in a low-income country** /This study aims to evaluate how severe the pain is after cesarean section. Apart from that, the research also aims to identify the types of painkillers used to manage pain after caesarean section as well as the level of patient satisfaction with the management of this pain./prospective cohort/Uganda/ (Kintu et al., 2019)	Eligible participants were all parturients undergoing cesarean section between 08.00 and 18.00, under spinal anesthesia with an American Society of Anesthesiologists (ASA) physical status classification of I to III and able to communicate freely with an interpreter who was not a family member to obtain informed consent. . All patients who experienced failure of spinal anesthesia and required general anesthesia were not included in this study.	*Purposive sampling*	333 Respondents	Normality assessment was carried out using graphic plots and the Shapiro-Wilk test. Because the data were not normally distributed, we used the Kruskal-Wallis test to determine differences in pain scores between treatment groups. The data from this analysis is submitted as the mean pain score, and its IQR. For patient satisfaction, the proportion of participants who were satisfied with their analgesia was estimated.	Pain control medications used in the first 24 hours after cesarean section at this hospital included diclofenac alone, pethidine alone, tramadol alone, and several pain medications. There are mothers who do not receive analgesic drugs. The highest pain score was reported at 6 hours (median: 37; (IQR: 37.5). 68% of participants reported that they were satisfied with their pain control.
A2/ **Post-caesarean section pain and quality of sleep among mothers who delivered by caesarean section under spinal anesthesia** / To determine the level of pain and identify the relationship between pain level and quality of sleep among mothers who delivered by caesarean section under spinal/cross-sectional anesthesia descriptive /Indonesia/ (Harini et al., 2021)	The inclusion criteria in this study were post-caesarean section mothers on the second day who were aged between 20-45 years, had experience with spinal anesthesia, had no verbal communication problems, were within the normal range of vital signs, and agreed to actively participate in this study.	*Purposive sampling*	50 respondents (mothers) aged 20-45 years	The data collection procedure began after an approval letter was issued by the Head of the Malang Regency Bakesbangpol (National and Political Unity Agency) Office. (SPSS) version 23.0 was used for data analysis. Univariate analysis was used to analyze descriptive statistics for demographic variables. A normality test was carried out before carrying out bivariate analysis and the results showed that data on post-cesarean section pain levels and sleep quality were not normally distributed (sig <0.05). Therefore , Spearman correlation was used to identify bivariate analysis. Significant factors that reduce sleep quality were identified using logistic regression.	A total of 38 mothers (76%) had severe levels of pain and the majority (43 mothers) had poor sleep quality. The Spearman correlation test shows that there is a relationship between the level of pain after cesarean section and sleep quality, p = 0.000 (p<0.05) and r = 0.314.

A3/ **Nursing Care Using Deep Breathing Therapy and Oxytocin Massage to Reduce Pain Intensity in Post Section Caesarea Patients: Case Study** / The aim of this case study is to analyze the intervention of deep breathing therapy and oxytocin massage in post Caesarean section patients with acute/descriptive pain nursing problems (study case)/Indonesia/ (Siregar, 2020)	Post-cesarean section patient	*Purposive sampling*	**The participant in this study was one patient with pain after caesarean section**	Data collection techniques were carried out by observation and interviews using an assessment format from the Faculty of Nursing, Padjadjaran University. Data obtained from observations and interviews were revalidated using interviews with nurses and midwives and data from patient medical records.	The main focus of the intervention provided is non-pharmacological pain management, namely by providing deep breathing relaxation techniques and oxytocin massage. After the procedure, the patient reported a decrease in pain intensity as evidenced by the pain scale from 6/10 pre-intervention to 1/10 post-intervention. Pain management in the form of deep breathing relaxation and oxytocin massage has a good effect in reducing the pain scale for post-operative caesarean section patients. These two therapies can be combined well so that the benefits can be optimally felt by the patient.
A4/ Experience and pain management of post-operative patients in the Kemuning V Room at Dr. Hasan Sadikin Bandung: (Case Study)/ The aim of this research is to describe the pain experience, analyze pain management and evaluate the effectiveness of post-operative pain management. /case study/Indonesia/ (Harini et al., 2021)	Post-operative patients (Operation Day to Post-operation Day 3) Adult patients aged ≥18 years Able to communicate Did not experience malignant disease	*Purposive sampling*	The respondents here were 4 patients	interviews, clinical examinations, pain measurements using the Numeric Rating Scale (NRS) and Verbal Rating Scale (VRS) instruments, and pain experiences were assessed using an open-ended questionnaire containing COLDSPA elements designed to obtain in-depth information related to the patient's pain experience, and documentation studies from notes. patient medical.	Research results regarding post-operative pain experiences vary and are influenced by several factors, namely age, gender, type of surgery and culture. Pain scale assessment cannot only involve one scale but can be seen from the characteristics of the patient, for example patients over 65 years of age are more effective using the Verbal Rating Scale (VRS). Giving analgesics is still less effective because the patient is not yet pain free. Non-pharmacological relaxation techniques are effective in reducing pain after abdominal surgery
A5/ Post-operative Experience Following Caesarean Section in a Nigerian Obstetric Population/ The aim of this study was to assess the experience of women undergoing caesarean section in the first 24 hours post-operatively/cross sectional/Nigeria/ (Garba, Panti, et al., 2021)	Inclusion criteria were those who underwent elective or emergency caesarean section under spinal anesthesia and had consented to participate in the study. Those who were unconscious or experienced intra-operative or post-operative complications were not included in this study	*Consecutive sampling*	193 respondents aged 25-34 years	Questionnaire Postoperative management was initiated immediately after CS and vital signs were closely monitored. All participants were given intravenous fluids and intravenous antibiotics (Ceftriazone and metro-nidazole). Analgesia is achieved with a combination of intramuscular pentazocine + rectal diclofenac or intra-muscular paracetamol + rectal diclofenac. They were followed up until 24 hours after surgery. The main outcome measures were pain and satisfaction scores. Secondary outcome measures were time to mobilization, time to initiation of oral feeding and time to initiation of	Mean pain scores among those undergoing emergency and elective cesarean sections ranged between 2 and 3 on all pain assessment points. Satisfaction was good among 66.1% who underwent emergency caesarean section and 71.2% among those who underwent elective caesarean section. However, the difference was not statistically significant ($\chi = 0.546$, $p = 0.761$). More than 90% of participants who underwent emergency or elective caesarean section did not ambulate in the first 24 hours after caesarean section and there was no relationship between the two. between ambulation time and type of cesarean section ($\chi = 0.005$, $p = 0.941$).

				spontaneous breastfeeding. Data analysis was carried out using the Statistical Package for Social Sciences version 22	
A6/ The Effect of Early Oral Feeding on Post-caesarean Pain: A randomized Clinical Trial/ The aim of this study was to determine the effect of early oral feeding on post-caesarean pain in patients undergoing caesarean section/RCT/Northwestern Iran/ (Rashidi et al., 2019)	Inclusion criteria for participating in this study are: having a singleton pregnancy, gestation age 38-42 weeks, undergoing a repeat caesarean section (history of at least one previous caesarean section), giving birth to a normal baby and using spinal anesthesia, having no medical conditions or obstetric disorders (diabetes, anemia, hypertension, cardiovascular , blood vessels, kidneys, lungs, gastrointestinal, thyroid, immune disorders, infectious diseases, psychiatric disorders, metabolic disorders, electrolyte disorders, and irritable bowel syndrome). Exclusion criteria included participants' unwillingness to continue the study.		126 women with repeat cesarean delivery	Samples were divided randomly into intervention (initial feeding) and control (routine feeding) groups. Pain severity was recorded before and 6, 12, 18, and 24 hours after the intervention. Data analysis was carried out using SPSS version 21.0. Descriptive statistics and analytical statistics, including t test, paired t test and repeated measures ANOVA were used. $P < 0.05$ was considered statistically significant.	The mean pain severity in the intervention group was significantly lower compared with the control group at 6, 12, 18, and 24 hours after intervention ($P < 0.001$). Conclusion: Early feeding can reduce the severity of pain after caesarean section.
A 7/ The Effect of Deep Breathing Relaxation Techniques on Post Sectio Caesarea Pain at Rupit Hospital/ The aim of the research was to determine the effect of deep breathing relaxation techniques on post sectio Caesarea pain at Rupit Hospital/ pra experiment/Indonesia/(Sari et al., 2022)	Patient after cesarean operation in the Aster Room at Rupit Hospital	*Total Sampling*	20 patients post caesarean section surgery	In this research, primary data uses pain scale sheets and secondary data uses patient medical records. Test the prerequisite hypothesis using the Shapiro Wilk test. The hypothesis test used is the Paired Sample T-Test	From the univariate data, it was found that the average post cesarean section pain picture before being given the deep breathing relaxation technique was 5.30 and after being given the deep breathing relaxation technique was 2.85. From bivariate data on the normality test of the pain scale before and after deep breathing relaxation ($p > 0.05$), the data was normally distributed. And the Paired Sample T-Test hypothesis test obtained a p-value < 0.000. Conclusion: there is an influence of deep breathing relaxation techniques on post caesarean section pain at Rupit Hospital.
A8/ Pain Intensity among Women with Post-Caesarean Section: A Descriptive Study/ This study aims to describe the intensity of pain in women after caesarean section/cross sectional/Indonesia/ (Marfuah et al., 2019)	Inclusion criteria: Post Section Caesarea patients and willing to be respondents. Data analysis in this study used Mean ± SD (Standard Deviation).	*Purposive sampling*	60 women post cesarean section	The instrument used was the Visual Rating Scale (VAS) for measuring pain. Descriptive study with Mean ± SD for univariate analysis.	Pain intensity among women with caesarean section was mild with an average pain level of 2.8. Women with mild pain levels were 81.6%. Conclusion: As a nurse, it can be considered as a non-pharmacological intervention to reduce the pain of cesarean section effectively and to

					reduce the number of drugs and their side effects
A9/ Assessment and determinants of acute post-caesarean section pain in a tertiary facility in Ghana/ This study assessed the adequacy of post- CS pain management as well as factors influencing this outcome. In addition, post-CS analgesia prescriptions and service habits of doctors and nurses are also explained to help fill existing knowledge gaps/cross-sectional/Ghana/ (Azanu et al., 2022)	Women were considered eligible if they (i) underwent CS at KATH and (ii) were conscious and able to communicate within 6–12 hours after surgery.	*Simple Random Sampling*	The sample size was estimated using the Cochran formula; n = (z/m)2P(1-P) where z is the reliability coefficient which is 1.96 with a 95% confidence interval, p is the estimated proportion of post-CS women with inadequate pain relief and m is the precision. Assuming a prevalence of 37% in post-CS women with inadequate pain control from a previous study [1] and a margin of error of 5%, a sample size of 359 was estimated. By adding 10% for non-response and data that may not contribute to the analysis, a final sample size of 400 was used.	Pain scores of 400 randomly selected, consenting women post-CS at a tertiary facility in Ghana were assessed at 6-12 hours post-CS at rest and with movement and at 24-36 hours post-CS with movement using a visual analogue scale (VAS) that has been validated from February 1, 2015 to April 8, 2015. Participant characteristics including age, marital status and CS duration were obtained using a pretested questionnaire and review of patient records. Descriptive statistics are presented in the form of frequencies and proportions. Associations between baseline characteristics and outcome variables of adequacy of pain control at 6-12 hours post-CS at rest and with movement and at 24-36 hours post-CS with movement were analyzed using the Chi-square test and Fisher's exact test and logistic regression methods . Adequate pain control was defined as a VAS score of less than equal 5.	At 6–12 hours post-CS (at rest), similar proportions of participants had adequate and inadequate pain control (50.1% vs 49.9%). Over the same time period but with movement, pain control was deemed inadequate in 93% of respondents (369/396). Women who had previous surgery [OR 0.47 95% CI 0.27, 0.82; p = 0.008] and those whose CS lasted longer than 45 minutes [OR 0.39 95% CI 0.24, 0.62; p < 0.001] had lower odds of reporting adequate pain control. Only 23.5% (12/51) and 10.3% (3/29) of women who were prescribed 12 hour and 8 hour doses of pethidine did it as prescribed. At 24-36 hours post CS, adequate pain control was reported by 85.3% (326/382) Pain management was deemed inadequate in the first 12 hours post-CS with potential implications for early mother-child interactions. A significant number of participants did not receive analgesics as prescribed. Additional pain control measures should be explored and healthcare workers should be encouraged to pay more attention to patients' pain relief needs

4. Critical Appraisal

Critical appraisal of a scientific article is an evaluation process that aims to assess the quality of the research article. In this review, researchers used an evaluation tool developed by the Joana Briggs Institute (JBI) to evaluate both quantitative and qualitative research. The selection of the JBI evaluation tool is based on the type of research that matches the tool. The researcher classified the value of the article based on the overall score obtained from the critical appraisal according to the guidelines provided by JBI. Detailed information regarding the critical appraisal results can be found in the table below.

Table 5. Critical Appraisal Cross Sectional

No	Question items	Articles code			
		A2	*A5*	*A9*	*A8*
1	Were the criteria for inclusion in the sample clearly defined?	3	3	3	3
2	Were the study subjects and the setting described in detail?	3	3	3	3
3	Was the exposure measured in a valid and reliable way?	3	3	3	3
4	Were objective, standard criteria used for measurement of the condition?	3	3	3	3
5	Were confounding factors identified?	3	3	3	3
6	Were strategies to deal with confounding factors stated?	2	3	3	3
7	Were the outcomes measured in a valid and reliable way?	3	3	3	2
8	Was appropriate statistical analysis used?	3	3	3	3
	Score	**23/A**	**24/A**	**24/A**	**23/A**

Table 6. JBI Critical Appraisal Cohort Study

No	Question items	Articles code		
		A1	*A3*	*A4*
1	Were the two groups similar and recruited from the same population?	3	3	3
2	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	3	3	3
3	Was the exposure measured in a valid and reliable way?	3	3	3
4	Were confounding factors identified?	2	3	3
5	Were strategies to deal with confounding factors stated?	2	3	2
6	Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	3	3	3
7	Were the outcomes measured in a valid and reliable way?	3	3	2
8	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	3	3	3
9	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	3	3	3
10	Were strategies to address incomplete follow up utilized?	3	3	3
11	Was appropriate statistical analysis used?	3	3	3
	Score	**31/A**	**33/A**	**31/A**

Table 7. JBI Critical Appraisal RCT

No	Question items	Articles code
		A6
1	Was true randomization used for assignment of participants to treatment groups?	3
2	Was allocation to treatment groups concealed?	3
3	Were treatment groups similar at the baseline?	3
4	Were participants blind to treatment assignment?	3
5	Were those delivering the treatment blind to treatment assignment?	3
6	Were treatment groups treated identically other than the intervention of interest?	3
7	Were outcome assessors blind to treatment assignment?	3
8	Were outcomes measured in the same way for treatment groups?	3
9	Were outcomes measured in a reliable way	3
10	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	3
11	Were participants analyzed in the groups to which they were randomized?	3
12	Was appropriate statistical analysis used?	3
13	Was the trial design appropriate and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	3
	Score	**36/A**

Table 8. JBI Critical Appraisal Quasi Experimental

No	Question items	Articles code
		A7
1	Is it clear in the study what is the "cause" and what is the "effect" (i.e. there is no confusion about which variable comes first)?	3
2	Was there a control group?	3
3	Were participants included in any comparisons similar?	3
4	Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	2
5	Were there multiple measurements of the outcome, both pre and post the intervention/exposure?	2
6	Were the outcomes of participants included in any comparisons measured in the same way?	3
7	Were outcomes measured in a reliable way?	3
8	Was follow-up complete and if not, were differences between groups in terms of their follow-up adequately described and analyzed?	3
9	Was appropriate statistical analysis used?	3
	Score	**25/A**

5. Result

Of the 870 articles identified, only nine met the criteria. These articles were written in English and published between 2019 and 2023. These nine articles shared several characteristics, such as year of publication, country of origin, and research methods used.

Table 9. Year Classification

No	Publication Year	Number of Articles
1	2019	3
2	2020	1
3	2021	2
4	2022	1
5	2023	2
	Total	**9**

Based on the table above, the articles reviewed are from 2019 to 2023. The details are: 3 articles in 2019 (A1,A6,A8), 1 article in 2020 (A4), 2 articles in 2021(A3,A5) , 1 article in 2022 (A9), and 2 articles in 2023 (A3,A7).

Table 10. Country Classification

No	Country	Number of Articles
1	Indonesia	5
2	Uganda	1
3	Nigeria	1
4	Iran	1
5	Ghana	1
	Total	**9**

Based on the table above, the articles reviewed came from 5 countries. The details are: 5 articles from Indonesia (A2, A3, A4, A, A8), 1 article from Uganda (A1), 1 article from Nigeria (A5), 1 article from Iran (A6), and 1 article from Ghana (A9).

Table 11. Classification of Research Designs

No	Design	Number of Articles
1	Cross-sectional	4
2	Cohort	3
3	RCT	1
4	Pre experimental	1
	Total	**9**

Based on the table above, the articles reviewed consisted of 4 types of research methods. The details are: 4 cross-sectional articles (A2,A5,A8,A9), 3 cohort articles (A1,A3,A4), 1 RCT article (A6), and 1 pre-experimental article (A7).

Theme Analysis

Table 12. Determination of themes and subthemes

Theme	Subtheme	Article
Supporting and inhibiting factors for pain management efforts	Supporting factors	A1, A4, A8, A9
	Inhibiting factors	A3, A4, A5, A6, A7, A8, A9
Implications of pain after caesarean section	Sleep quality	A2
Patient Characteristics	Age Type of surgery Culture	A4

5.1. Supporting and inhibiting factors for pain management efforts

1) Supporting Factors

Factors identified in the study (A1, A4, A8, A9) as supporting post-cesarean section pain control in the hospital included the use of a wide selection of pain control medications such as diclofenac, petidine, and tramadol (A1, A9), which allowed personalization of treatment according to the individual needs of the patient. Variations in pain management provide the flexibility to customize therapy according to patient response, with the importance of pain score monitoring and rapid response showing a median score of 37 at 6 hours post-operatively, and a 68% satisfaction rate demonstrating the effectiveness of pain management strategies. Studies (A4, A8) show that non-pharmacological relaxation techniques are more effective in reducing post-abdominal surgery pain. Study (A8) showed that pain intensity among women with caesarean section was mild with an average pain level of 2.8. Women with mild pain levels were 81.6%. In study (A9) Factors favoring better pain control post-cesarean section included appropriate analgesic prescribing with petidine and more intensive pain control monitoring within 24-36 hours post-operatively, which increased the percentage of adequate pain control to 85.3%. This suggests that timely analgesic management that is responsive to patients' pain needs significantly contributes to patients' comfort experience post-cesarean section.

The study by Marzouk et al (2019) showed highly statistically significant differences in pain scores only at 2 hours and 6 hours after delivery, as well as significant differences before and after the intervention in total anxiety scores at 2 hours, 6 hours, 12 hours, and 18 hours after delivery. In the control group, there were no significant differences in pain scores after the intervention at the same time intervals, but there were significant differences in total anxiety scores at 6 hours, 12 hours, and 18 hours after delivery, although not significant at 2 hours after delivery. The recommendation from this study is to incorporate foot reflexology by specialists into the Nursing Management Protocol to manage postpartum pain and reduce anxiety levels. The results showed that both acupuncture TENS and conventional TENS significantly reduced postoperative pain intensity compared to the control group (p value <0.0001). In conclusion, both acupuncture TENS and conventional TENS were equally effective in reducing pain in the post-cesarean section incision with strong intensity and did not cause significant pain (Mehendale & Revadkar, 2018). The anesthesia team, which included one of the researchers, evaluated overall pain levels since surgery using a Visual Analog Scale (VAS), as well as recording any complications that occurred since surgery and the patient's level of satisfaction with pain management. A total of 150 patients were monitored during this study. Common methods of pain control included intravenous opioid infusion (94%) with the use of co-analgesia in 99% of patients. Evaluation of pain at rest showed that 89.7% of patients had pain between scores 1-3 on the VAS, 9.5% with scores 4-6, and 0.8% with scores 7-10. During movement, 60.1% of patients reported pain with a score of 1-3, 33.1% with a score of 4-6, and 6.8% with a score of 7-10. The majority of patients (76.60%) expressed satisfaction with postoperative pain management, while 23.40% expressed dissatisfaction. Overall, although postoperative pain care was well implemented and followed by both teams in the hospital, there was an unsatisfactory assessment from the patient's perspective (Moshfaq et al., 2022).

From the discussion, the study showed that non-pharmacological techniques such as foot reflexology and appropriate analgesic management such as the use of diclofenac, petidine, and tramadol have a crucial role in post-cesarean section pain control. Studies also highlighted the effectiveness of acupuncture TENS and conventional TENS in significantly reducing postoperative pain intensity. However, assessment of patient satisfaction with pain management still shows some challenges, with some patients feeling dissatisfied with the care provided. Therefore, strategies to

improve the patient experience with post-cesarean pain management need to be continuously developed and optimized.

2) Inhibiting Factors

Barriers to post-cesarean section pain control in the study (A3, A4, A5, A6, A7, A8, A9). These included inadequate pain management in the first 12 hours post-operatively, especially during rest and movement, which was experienced by most participants. The study showed that more than half of the respondents did not achieve adequate pain control in the 6-12 hours post-operatively, with the failure rate to achieve significant pain control during movement reaching 93%. Risk factors such as a history of previous surgery and longer duration of surgery were also associated with lower chances of achieving adequate pain control. In addition, low adherence to analgesic prescriptions, such as petidine administration, was also a significant issue.

Contributing factors in post-cesarean section pain control include inadequate pain management in the first 12 hours after surgery(A6), failure rates to achieve pain control on movement (A5), and risks such as a history of previous surgery and longer duration of surgery (A9).

5.2. Implications of Postoperative Pain

In study (A2), 38 mothers out of a total of 50 respondents (76%) experienced a level of post-cesarean pain categorized as severe, and the majority of them, 43 mothers, reported experiencing poor sleep quality. The Spearman correlation test results showed a significant relationship between the level of post-cesarean pain and sleep quality, with a correlation coefficient (r) of 0.314 and a significance value (p) <0.05. This shows that the higher the level of pain felt by postoperative mothers, the worse the quality of sleep experienced. This finding confirms the importance of effective pain management in influencing the sleep quality of post-cesarean section patients.

The results showed that most post-cesarean section clients experienced severe pain intensity, with 22 respondents (52.4%) reporting high levels of pain, and 20 respondents (47.6%) feeling uncomfortable. More than half of the respondents, 28 people (66.7%), also experienced sleep disturbances. This study found a correlation between the level of pain intensity and sleep quality in post-cesarean section patients. The discussion indicates that the pain experienced by patients as a result of surgical trauma can interfere with sleep quality, with the level of disturbance getting worse as the intensity of pain increases. In conclusion, there is a significant relationship between pain level and sleep quality in post-cesarean section patients. It is hoped that health services can actively involve families in the pain management of post-cesarean section patients to improve their sleep quality (Noviyanti et al., 2017). The results showed that the average age of respondents was 30.34 years old, with high school education, work as a housewife, primigravida parity, and an average caesarean section frequency of 1.18 times. The results also showed that most respondents had good sleep quality (66.7%) (Dieb et al., 2020; Sari & Mila, 2022; Segerdahl et al., 2015b).

A single injection of bupivacaine with adrenaline in the surgical wound has been shown to reduce the need for postoperative rescue morphine and is effective and safe in managing pain in women undergoing CS, under both spinal and general anesthesia. The use of oral OXY as standard postoperative treatment after CS has also been shown to be effective in providing better pain control, with lower opiate consumption compared to the use of IVM/codeine, as part of a broader analgesic regimen. Our clinical data and pharmacokinetic analysis support the view that treatment with OXY is safe for both mother and newborn. With severe postoperative pain as a risk factor for chronic pain, early management of pain is critical, and we found that experiences related to quality of life can be significantly impaired in women with ongoing pain. We recommend that our findings could have important clinical implications, especially for women undergoing CS under general anesthesia (Segerdahl et al., 2015a).

The results of the review showed that there was a significant association between post-cesarean section pain levels and sleep quality, with higher pain levels associated with poorer sleep quality. These findings emphasize the importance of effective pain management to improve sleep quality in post-cesarean section patients. The study also supports the use of bupivacaine injections with adrenaline and oral OXY treatment as effective options in reducing the need for postoperative opiates and providing better pain control, with potentially significant clinical benefits for patients undergoing CS under general anesthesia.

5.3. Patient Characteristics

In study (A4) the results showed that postoperative pain experience is diverse and influenced by factors such as age, gender, type of surgery, and culture. Evaluation of pain scales should not rely on only one method, but should consider individual characteristics, such as the preference for using the Verbal Rating Scale (VRS) which is more effective for patients over 65 years old. Despite this, analgesic administration still does not achieve optimal effectiveness as many patients still experience pain. Nonpharmacological techniques, such as relaxation, have been shown to be effective in reducing post-abdominal surgery pain.

The results of the Spearman correlation test showed a significant relationship between the preoperative anxiety level score and the level of post-cesarean section pain using the spinal anesthesia technique at RSUD dr. Zubir Mahmud, East Aceh Regency, with a p-value of 0.002 ($p < 0.05$). This study concluded that the level of anxiety before surgery correlates with the level of post-cesarean section pain using spinal anesthesia technique at the hospital. The characteristics of the respondents showed that the majority were aged 20-30 years (63.6%) and as many as 17 respondents (51.5%) had previous experience with sectio caesarea (Saputra et al., 2016).

The conclusion of the study (A4) highlights the need for a holistic approach in the evaluation and management of postoperative pain, taking into account factors such as age, gender, type of surgery and culture. In addition, the finding that preoperative anxiety level correlates with postoperative pain of caesarean section using spinal anesthesia technique confirms the importance of comprehensive psychological treatment in clinical practice.

6. Conclusion

This scoping review identified that the experience of postoperative pain in post-cesarean section mothers in developing countries remains a significant challenge, especially in the first 12 hours after surgery. Factors influencing the pain experience include the type and regularity of analgesic administration, history of previous surgery, duration of surgery, as well as individual characteristics such as age, anxiety level and social support. Effective pain management strategies include a combination of pharmacological (such as the use of petidine, tramadol and diclofenac) and non-pharmacological (such as breath relaxation techniques and oxytocin massage) approaches that have been shown to decrease pain intensity and increase patient satisfaction. However, obstacles such as low adherence to analgesic protocols and lack of intensive pain monitoring are still common.

It is recommended that health professionals implement holistic and evidence-based post-cesarean pain management, combining pharmacological and non-pharmacological approaches such as breath relaxation and oxytocin massage. Comprehensive preoperative education to patients needs to be improved to prepare mothers physically and to deal with postoperative emotional pain. In addition, periodic training for medical personnel and close monitoring of compliance in analgesic administration are essential to ensure effective pain management. An individualized approach that considers the patient's age, medical history, anxiety level and cultural values should also be an integral part of the care strategy. More extensive follow-up studies are also needed to establish the long-term impact of various interventions on maternal recovery and quality of life after cesarean delivery.

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