

ARTIGO ORIGINAL / ORIGINAL ARTICLE

Clinical Outcomes and Satisfaction of Intrathecal Labor Analgesia: A Prospective Quasi-Experimental Study with Photowalk Insights

Resultados Clínicos e Satisfação com Analgesia Intratecal no Trabalho de Parto: um Estudo Quase-Experimental Prospetivo com Contributos de Photowalk

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Keywords

Analgesia, Obstetrical; Labor, Obstetric; Anesthesia, Epidural; Patient Satisfaction; Treatment Outcome.

Palavras-chave

Analgesia Obstétrica; Anestesia Epidural; Resultado do Tratamento; Satisfação do Doente; Trabalho de Parto.

ABSTRACT

Introduction: Labor pain significantly influences maternal experience, satisfaction, and childbirth outcomes. This study compared clinical outcomes and maternal satisfaction following intrathecal bupivacaine with opioids versus no analgesia and explored emotional experiences using a mixed quantitative–qualitative photowalk approach.

Methods: A prospective, quasi-experimental study was conducted among 126 parturients ≥ 37 weeks in active labor, assigned to intrathecal labor analgesia (LA; $n=63$; bupivacaine 2 mg, morphine 0.2 mg, fentanyl 25 μg) or without labor analgesia (WoLA; $n=63$). Outcomes assessed included pain relief, hemodynamic stability, labor progress, neonatal wellbeing, and satisfaction.

Results: Baseline pain was comparable ($p=0.195$). Within five minutes, the LA group achieved near-complete analgesia (0.05 ± 0.21 vs 9.52 ± 1.17 ; $p=0.001$). At 30 minutes, contractions were longer and more effective in the LA group (38.60 ± 7.33 vs 31.52 ± 4.87 s; $p=0.005$). Neonatal 1-minute APGAR scores were higher with LA (7.09 ± 1.30 vs 6.54 ± 1.43 ; $p=0.025$), and fetal complications were lower (4.8% vs 15.9%). Total labor duration was significantly shorter (4.08 ± 2.56 h vs 8.59 ± 4.48 h; $p<0.001$). In the LA group, 79.4% of women reported very high satisfaction. Photowalk analysis demonstrated visible emotional ease following analgesia, while WoLA participants expressed fulfilment through endurance.

Conclusion: Intrathecal bupivacaine with opioids provides rapid, effective labor analgesia, improves maternal, clinical and neonatal outcomes, and achieves high satisfaction in low-resource settings. Photowalk findings reveal that maternal satisfaction encompasses not only pain control, but also emotional resilience, perceived safety, and trust in care.

RESUMO

Introdução: A dor no trabalho de parto (TP) influencia a experiência materna e *outcomes* obstétricos/neonatais. Este estudo comparou os resultados clínicos e satisfação materna após analgesia intratecal com bupivacaína mais opioides versus ausência de analgesia, explorando também experiências emocionais através de uma abordagem quantitativa–qualitativa *photowalk*.

Métodos: Estudo prospetivo, quase-experimental, envolvendo 126 parturientes com ≥ 37 semanas de gestação em TP ativo, distribuídas entre Analgesia Intratecal (AI; $n=63$, bupivacaína 2 mg, morfina 0,2 mg, fentanil 25 μg) ou Sem AI (SAI; $n=63$). Avaliaram-se alívio da dor, estabilidade hemodinâmica, progresso do TP, bem-estar neonatal e satisfação materna.

Resultados: A dor basal foi semelhante entre os grupos. O grupo AI atingiu analgesia quase completa nos primeiros cinco minutos ($0,05 \pm 0,21$ vs $9,52 \pm 1,17$; $p=0,001$). Aos 30 minutos, as contrações foram mais longas no grupo AI ($38,60 \pm 7,33$ vs $31,52 \pm 4,87$ s; $p=0,005$). O APGAR no 1.º minuto foi maior no grupo AI ($7,09 \pm 1,30$ vs $6,54 \pm 1,43$; $p=0,025$) e houve menos complicações fetais (4,8% vs 15,9%). A duração do TP foi mais curta no grupo AI ($4,08 \pm 2,56$ h vs $8,59 \pm 4,48$ h; $p<0,001$) e 79,4% das puérperas relataram elevada satisfação. A análise do *photowalk* evidenciou tranquilidade emocional após analgesia, enquanto as participantes sem analgesia sentiram-se realizadas pela resistência à dor.

Conclusão: A analgesia intratecal com bupivacaína e opioides proporciona alívio rápido e eficaz da dor, melhora os desfechos maternos/neonatais e está associada a elevados níveis de satisfação em contextos de recursos limitados. A satisfação materna reflete não apenas controlo da dor, mas também fatores emocionais e de segurança.

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INTRODUCTION

Labor is widely recognized as one of the most agonizing physiological experiences in a woman's lifetime, with its intensity and perception varying among individuals. The lack of adequate antenatal psychological support, coupled with fear and anxiety, often amplifies the perception of pain during childbirth.¹ Effective pain relief in labor is therefore not only essential for maternal comfort but also has physiological benefits, including attenuation of stress hormone release and improved uteroplacental circulation, enhancing fetal oxygenation and nutrient delivery.

Epidural analgesia (EA) is the gold standard for labor analgesia in high-income countries but is underutilized in resource-limited settings due to cost, equipment, and skilled expertise requirements.² Intrathecal labor analgesia provides a simpler, affordable alternative suitable for low- and middle-income countries (LMIC). Despite its importance, the accessibility and utilization of labor analgesia in many LMIC remain sub-optimal. Intrathecal labor analgesia offers a more economical, technically simpler, and feasible alternative. Single-dose intrathecal administration is particularly advantageous in peripheral and district-level hospitals where epidural catheterization may not be practical.³ Importantly, if cesarean section becomes necessary later, there is no contraindication to subsequent spinal or epidural anesthesia.⁴

Pharmacological advances have further optimized intrathecal techniques. The addition of opioids to local anesthetics allows for a substantial reduction in bupivacaine concentration from 0.5% to as low as 0.065% while maintaining effective analgesia and minimizing motor block or interference with labor progression.⁵ Combining low doses of local anesthetics with opioids such as fentanyl and morphine achieves effective pain relief with high maternal satisfaction and fewer side effects.^{6,7} However, concerns remain regarding maternal pruritus, fetal bradycardia, and an increased rate of cesarean delivery due to fetal heart rate abnormalities, as reported in systematic reviews and prospective studies.^{8,9} Despite these risks, overall maternal satisfaction and quality of analgesia remain superior when intrathecal opioids are incorporated.

In developing countries, the demand for labor analgesia is substantial. Surveys suggest that up to 85% of women would request pain relief if available, yet only 40% actually receive it.¹⁰ In Ghana, access to epidural analgesia is largely confined to tertiary teaching hospitals, limiting options for women in rural areas who rely on primary and district-level facilities.^{5,11} Thus, evaluating the safety, efficacy, and acceptability of intrathecal combinations, particularly those involving bupivacaine with fentanyl and morphine, becomes a critical step toward expanding access to labor analgesia in resource-limited settings.

This prospective quasi-experimental study with integrated photowalk insights aims to fill this gap by not only assessing clinical outcomes and maternal satisfaction with intrathecal opioids plus bupivacaine but also visually documenting the emotional and physical transformations of laboring women before and after analgesia. Such an approach provides both

quantitative and qualitative perspectives, strengthening the evidence base for cost-effective, safe, and patient-centered labor pain management strategies in LMIC.

METHODOLOGY

This study employed a prospective, quasi experimental design to assess the clinical outcomes and maternal satisfaction associated with intrathecal labor analgesia compared with no analgesia, while also incorporating a photowalk approach to capture women's subjective and emotional experiences. The study was conducted among 126 parturients at term who were recruited consecutively from the obstetric unit after meeting eligibility criteria and providing informed consent.

Setting and Ethics: The study was carried out between November 2024 and September 2025 at the Maternity Unit of Kwadaso SDA Hospital, Kumasi, Ghana, a 150-bed district hospital with approximately 500 deliveries annually. Ethical approval was obtained from the Navrongo Health Research Centre Institutional Review Board (NHRCIRB689) and the hospital's maternity unit. All participants provided written informed consent in their preferred language using standardized forms. The study adhered to the principles of the Declaration of Helsinki (1975, revised in 2024).

Eligibility Criteria: Inclusion criteria were women aged 18 to 45 years, with singleton pregnancies at term (37 to 42 weeks), in the active phase of labor (cervical dilation 4–7 cm), eligible for intrathecal analgesia, and willing to provide informed consent. Exclusion criteria included high-risk pregnancies (e.g., preeclampsia, multiple gestation), contraindications to vaginal delivery, chronic pain conditions, substance abuse, or refusal to consent.

Sample Size: The sample size was calculated using the Kelsey formula for two proportions. Based on Singh *et al*,¹¹ where 58.8% in the analgesia group versus 33.4% in controls were expected to achieve a pain score ≤ 4 , the minimum required sample size was 57 per group. Allowing for a 10% attrition rate, 63 participants were recruited per group, resulting in a total sample of 126 women.

Sampling: A multistage sampling strategy was used. First, purposive sampling identified eligible women. Participants were then assigned to groups based on their preference for labor analgesia. Within each group, simple random sampling (ballot draw of "yes/no" slips) ensured equal selection. A pilot study involving 26 women (20% of the sample) was conducted to refine the data collection tools and study procedures.

Study Groups: Participants were allocated into two groups according to their preference. The labor analgesia (LA) group, $n = 63$, received a single intrathecal injection of bupivacaine (2 mg), morphine (0.2 mg), and fentanyl (25 mcg). The without labor analgesia (WoLA) group, $n = 63$, did not receive intrathecal labor analgesia and were managed according to standard obstetric protocols.

Photowalk Documentation: To complement the quantitative outcomes, a photowalk methodology was incorporated as a novel qualitative component. Each parturient was invited to take one photograph of her choice before labor (or be-

fore intrathecal injection in the LA group) and another photograph of her choice after delivery. Participants were free to capture any subject of personal meaning, such as surroundings, symbolic objects, supportive persons, or self-portraits, thereby reflecting their emotional states and personal perspectives without any verbal cues.

Data Collection: Structured case report forms captured demographic and clinical data, pain assessment with the Numerical Rating Scale (NRS) at predefined intervals, labor progression with the partograph, maternal safety with hemodynamic, respiratory, and adverse drug effects monitoring and neonatal outcomes using Apgar scores at 1 and 5 minutes. Maternal satisfaction was assessed at 24 hours postpartum using a Likert scale questionnaire alongside photowalk documentation. The photowalk outputs (participant-selected photographs) were collected concurrently to provide complementary qualitative insights into maternal satisfaction and birth experience.

Ethical Considerations: Written informed consent was obtained from all participants, including explicit consent for both standardized and participant-generated photography. Images were anonymized, and privacy was safeguarded by ensuring that photographs were used solely for research and publication purposes without revealing personal identifiers. The study protocol was reviewed and approved by the institutional review board.

Validity and Reliability: Allocation based on preference minimized ethical concerns, while random sampling within groups reduced selection bias. Standardized and validated tools were used (NRS for pain, partograph for labor monitoring, Apgar scoring for neonatal outcomes). All data collectors were trained and used uniform protocols, ensuring reliability and reproducibility of measurements. For the photowalk component, photographs were analyzed qualitatively using thematic content analysis. Images were reviewed independently by two researchers and coded for recurring visual and symbolic themes (e.g., fatigue, anxiety, relief, joy, empowerment). Discrepancies were resolved by consensus. Themes were then triangulated with quantitative findings on pain relief and satisfaction to provide a deeper understanding of women's experiences.

Data Analysis: Data were entered into a secure Excel database and analyzed with SPSS version 27.0. Descriptive statistics (mean, standard deviation, proportions) summarized baseline characteristics and outcomes. Independent t-tests compared continuous variables (e.g., pain scores, labor duration). Chi-square tests compared categorical variables (e.g., maternal satisfaction, neonatal outcomes). Statistical significance was set at $p < 0.05$.

RESULTS

A total of 251 parturients met the eligibility criteria, of whom 126 were included in the final analysis, as shown in **Fig. 1**. The sociodemographic characteristics of participants are presented in **Table 1**. The mean age of the LA group was 27.7 ± 6.1 years, compared to 30.5 ± 5.5 years in the WoLA group,

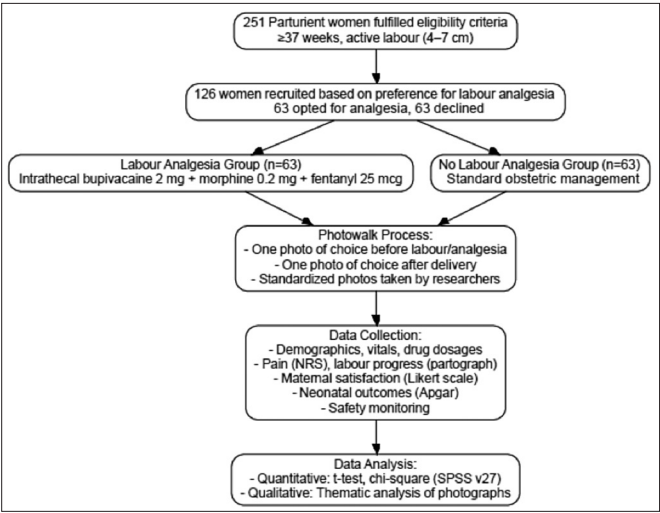


Figure 1. Study Flow Diagram.

Table 1. Sociodemographic and Obstetric Characteristics.

Variable	LA Group (n=63)	WoLA Group (n=63)	p value
Age (Mean ±SD)	27.7 ± 6.1	30.5 ± 5.5	0.085
18-19 years	5 (7.9)	0 (0.0)	
20-24 years	16 (25.4)	10 (15.9)	
25-29 years	19 (30.2)	19 (30.2)	
30-34 years	11 (17.5)	15 (23.8)	
35-39 years	12 (19.0)	18 (28.6)	
40-44 years	0 (0.0)	1 (1.6)	
Marital Status			
Single	24 (38.1)	26 (41.3)	0.856
Married	39 (61.9)	37 (58.7)	
Occupational Status			0.148
Unemployed	5 (7.9)	7 (11.1)	
Employed	52 (82.5)	55 (87.3)	
Student	6 (9.5)	1 (1.6)	
Educational Level			0.784
No formal Education	3 (4.8)	5 (7.9)	
Primary	3 (4.8)	6 (9.5)	
JHS	16 (25.4)	14 (22.2)	
SHS	24 (38.1)	21 (33.3)	
Tertiary	17 (27.0)	17 (27.0)	
Gestational Age (Mean ±SD)	39 ± 0.9	38.9 ± 1.3	0.147
37 weeks	2 (3.2)	9 (14.3)	
38 weeks	16 (25.4)	13 (20.6)	
39 weeks	27 (42.9)	23 (36.5)	
40 weeks	15 (23.8)	11 (17.5)	
41 weeks	3 (4.8)	5 (7.9)	
42 weeks	0 (0.0)	2 (3.2)	
Gravidity			0.019*
1-2	16 (25.4)	18 (28.6)	
3-4	33 (52.4)	24 (38.1)	
5+	14 (22.2)	21 (33.3)	
Parity			0.129
0	22 (34.9)	15 (23.8)	
1-2	31 (49.2)	29 (46.0)	
3-4	9 (14.3)	13 (20.6)	
5+	1 (1.6)	6 (9.5)	
Previous Labor Analgesia			0.496
Yes	2 (3.2)	0 (0.0)	
No	61 (96.8)	63 (100.0)	
Fetal Presentation			
Cephalic	63 (100.0)	63 (100.0)	-
Other	0	0	

Data are expressed as mean ± standard deviation (SD), numbers and percentage (%). LA: labor analgesia; WoLA: without labor analgesia; JHS: junior high school, SHS: senior high school. * significant.

with no statistically significant difference between them ($p=0.085$). The majority of participants were aged between 25 and 29 years, $n=19$ (30.2%) in each group. Most participants were married, 39 (61.9%) in the LA group and 37 (58.7%) in the WoLA group and had similar employment status. Regarding educational level, most participants had completed senior high school (24 [38.1%] in LA; 21 [33.3%] in WoLA), while 17 (27.0%) in each group had tertiary education.

The mean gestational age was similar between groups (LA: 39.0 ± 0.9 weeks; WoLA: 38.9 ± 1.3 weeks; $p=0.147$). Gravidity differed significantly ($p=0.019$), with more prior pregnancies 3-4 in the LA group and more ≥ 5 in the WoLA group. Parity distribution was comparable ($p=0.129$), with most being 1-2. Only 2 (3.2%) women had prior experience with labor analgesia. All had cephalic fetal presentation, indicating similar baseline obstetric profiles between groups.

Table 2 summarizes the pain outcomes following intrathecal administration. At baseline, pain scores were similar in both groups (9.73 ± 0.57 vs 9.56 ± 0.89 ; $p=0.195$). After 5 minutes, pain scores in the LA group dropped significantly to 0.05 ± 0.21 , while the WoLA group maintained severe pain (9.52 ± 1.17 ; $p=0.001$). This profound analgesic effect persisted throughout labor, with the LA group maintaining near-zero pain with only a minimal increase after 2 hours.

Table 2. Pain Scores.

Variable	LA (Mean $\pm$ SD)	WoLA (Mean $\pm$ SD)	t(df)	p value
Baseline Pain Score	9.73 $\pm$ 0.57	9.56 $\pm$ 0.89	1.305 (105.67)	0.195
Pain Score 5 min	0.05 $\pm$ 0.21	9.52 $\pm$ 1.17	-62.93 (66)	0.001*
Pain Score 10 min	0.00 $\pm$ 0.00	9.67 $\pm$ 0.76	-100.69 (62)	0.001*
Pain Score 15 min	0.00 $\pm$ 0.00	9.67 $\pm$ 0.82	-93.22 (62)	0.001*
Pain Score 1h	0.00 $\pm$ 0.00	9.83 $\pm$ 0.61	-127.82 (124)	0.001*
Pain Score 2h	0.38 $\pm$ 1.28	9.79 $\pm$ 0.92	-47.53 (62)	0.001*
Pain Score 4h	1.24 $\pm$ 1.97	9.84 $\pm$ 0.88	-31.58 (85.9)	0.001*

Data are expressed as mean $\pm$ standard deviation (SD), distribution (t) and degrees of freedom (df) with independent samples t-test. LA: labor analgesia; WoLA: without labor analgesia; min: minutes; h: hours; * significant.

Table 3 presents the pattern of uterine contractions. At baseline, the frequency and duration of contractions were comparable between groups. From 30 minutes post-intervention, the LA group exhibited significantly more frequent and longer contractions. This trend persisted throughout labor.

Table 4 presents the mean fetal heart rate (FHR) and APGAR scores. The FHR was comparable between groups except at 3 and 3.5 hours after intrathecal administration. After that, the FHR was similar in both groups again. Neonatal outcomes were favorable in both groups, but APGAR scores were significantly higher in the LA group at both 1 and 5 minutes.

Fig. 2 shows the fetal complications. In the LA group, there were 3 (4.8%) fetal complications compared to 10 (15.9%) in the WoLA group, $p=0.038$. The most reported complication was birth asphyxia.

Table 5 presents the duration of labor. The total labor duration was significantly shorter in the LA group (4.08 ± 2.56

Table 3. Uterine Contractions.

Variable	LA (Mean $\pm$ SD)	WoLA (Mean $\pm$ SD)	t(df)	p value
Baseline Contractions	2.87 $\pm$ 0.91	2.84 $\pm$ 0.45	0.25 (90.50)	0.804
Baseline Duration of Contractions (sec)	31.25 $\pm$ 4.46	31.87 $\pm$ 4.32	-0.79 (124)	0.431
Contractions at 30 min	3.02 $\pm$ 0.83	2.61 $\pm$ 0.71	2.89 (124)	0.005*
Duration of Contractions 30 min (sec)	38.60 $\pm$ 7.33	31.52 $\pm$ 4.87	6.39 (107.79)	0.001*
Contractions at 1h	3.27 $\pm$ 0.83	2.69 $\pm$ 0.82	3.90 (123)	0.001*
Duration of Contractions 1h (sec)	40.26 $\pm$ 6.69	32.32 $\pm$ 6.21	6.88 (122.02)	0.001*
Contractions at 1.5h	3.35 $\pm$ 0.97	2.75 $\pm$ 0.72	3.70 (96.87)	0.001*
Duration of Contractions at 1.5h (sec)	41.74 $\pm$ 6.35	34.51 $\pm$ 5.53	6.53 (113)	0.001*
Contractions at 2h	3.52 $\pm$ 0.94	2.85 $\pm$ 0.75	4.01 (88.10)	0.001*
Duration of contractions at 2h (sec)	41.81 $\pm$ 6.82	33.95 $\pm$ 5.28	6.78 (107)	0.001*
Contractions at 2.5h	3.61 $\pm$ 0.94	2.91 $\pm$ 0.61	4.14 (59.63)	0.001*
Duration of contractions at 2.5h (sec)	42.48 $\pm$ 6.40	35.59 $\pm$ 5.07	5.87 (94)	0.001*
Contractions at 3h	3.62 $\pm$ 0.87	2.91 $\pm$ 0.62	4.09 (49.33)	0.001*
Duration of Contractions at 3h (sec)	43.18 $\pm$ 7.45	35.76 $\pm$ 5.41	5.36 (85)	0.001*
Contractions at 3.5h	3.57 $\pm$ 0.70	3.09 $\pm$ 0.59	3.01 (43.23)	0.002*
Duration of Contractions at 3.5h (sec)	42.92 $\pm$ 8.55	37.34 $\pm$ 5.09	3.63 (77)	0.001*
Contractions at 4h	3.54 $\pm$ 0.59	3.12 $\pm$ 0.73	2.46 (71)	0.011*
Duration of Contractions at 4h (sec)	43.29 $\pm$ 9.47	36.12 $\pm$ 6.99	3.65 (1)	0.002*

Data are expressed as mean $\pm$ standard deviation (SD), distribution (t) and degrees of freedom (df) with independent samples t-test. LA: labor analgesia; WoLA: without labor analgesia; sec: seconds; min: minutes; h: hours; * significant.

Table 4. Fetal Heart Rate and APGAR Scores.

Variable	LA (Mean $\pm$ SD)	WoLA (Mean $\pm$ SD)	t(df)	p value
FHR Baseline	140.08 $\pm$ 6.77	138.76 $\pm$ 8.53	0.9 (11.96)	0.333
FHR 5 min	140.38 $\pm$ 8.29	140.63 $\pm$ 8.45	-0.17 (124)	0.865
FHR 30 min	141.76 $\pm$ 7.96	139.78 $\pm$ 8.07	1.39 (12)	0.167
FHR 1h	142.61 $\pm$ 7.04	142.67 $\pm$ 8.52	-0.42 (121)	0.967
FHR 1.5h	142.36 $\pm$ 6.75	143.85 $\pm$ 8.64	-1.03 (116)	0.303
FHR 2h	143.37 $\pm$ 7.75	144.07 $\pm$ 8.32	-0.66 (110)	0.513
FHR 2.5h	144.07 $\pm$ 7.71	145.07 $\pm$ 9.08	-0.58 (9)	0.566
FHR 3h	142.92 $\pm$ 6.63	148.16 $\pm$ 9.21	-2.98 (90)	0.004*
FHR 3.5h	145.93 $\pm$ 5.57	149.87 $\pm$ 11.88	-2.00 (77.65)	0.049*
FHR 4h	146.40 $\pm$ 6.96	150.16 $\pm$ 11.96	-1.32 (69)	0.192
FHR 4.5h	147.61 $\pm$ 6.25	150.67 $\pm$ 12.02	-0.88 (56)	0.384
FHR 5h	148.18 $\pm$ 6.88	151.40 $\pm$ 11.92	-0.86 (51)	0.396
APGAR 1 min	7.09 $\pm$ 1.30	6.54 $\pm$ 1.43	2.27 (124)	0.025*
APGAR 5 min	8.24 $\pm$ 1.39	7.69 $\pm$ 1.56	2.04 (124)	0.043*

Data are expressed as mean $\pm$ standard deviation (SD), distribution (t) and degrees of freedom (df) with independent samples t-test. LA: labor analgesia; WoLA: without labor analgesia; FHR: fetal heart rate; min: minutes; h: hours; * significant.

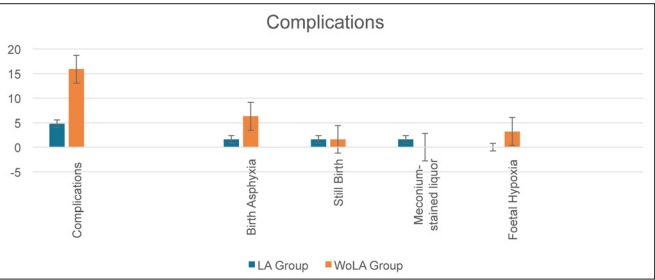


Figure 2. Shows the percentage of fetal complications in Group LA: labor analgesia; Group WoLA: without labor analgesia.

Table 5. Labor Duration.

Variable	LA (Mean±SD)	WoLA (Mean±SD)	t(df)	p value
Total Duration of Labor (h)	4.08±2.56	8.59±4.48	-6.43 (80.96)	0.001*
1st Stage (h)	3.55±2.54	8.13±4.49	-6.58 (80.11)	0.001*
2nd Stage (min)	16.72±15.24	22.98±14.88	-2.19 (109)	0.031*
3rd Stage (min)	7.17±5.30	7.51±2.65	-0.43 (110)	0.667

Data are expressed as mean ± standard deviation (SD), distribution (t) and degrees of freedom (df) with independent samples t-test. Group LA: labor group; WoLA: without labor analgesia; h: hours; min: minutes; * Significant.

hours) compared to the WoLA group (8.59 ± 4.48 hours; $p=0.001$), the main difference being during the first and second stages.

Table 6 summarizes maternal complications. Overall, complications were significantly fewer in the LA group, $p<0.001$. Maternal fatigue and perineal tear were the most common complications. Most women had blood loss <500 mL.

Table 6. Maternal Complications.

Variable	LA Group n (%)	NLA Group n (%)	p value
Maternal Complications?			<0.001*
Yes	15 (23.8)	34 (54.0)	
No	48 (76.2)	29 (46.0)	
Complications			
Prolonged Labor	1 (5.6)	2 (6.5)	
Fetal Distress	2 (11.1)	0 (0.0)	
Maternal Fatigue	2 (11.1)	8 (25.8)	
Perineal Tear	13 (72.2)	28 (90.3)	
Estimated Blood Loss			
<500 mL	58 (92.1)	53 (84.1)	0.271
≥500 mL	5 (7.9)	10 (15.9)	

Data are expressed as numbers and percentage (%). Group LA: labor analgesia; Group WoLA: without labor analgesia; mL: milliliters; * significant.

Satisfaction with pain control was assessed using a five-point Likert scale and photowalk reflections. As shown in Table 7, most women in the LA group reported being *very satisfied* (50 [79.4%]) with none expressing dissatisfaction. In contrast, nearly all women (61 [96.8%]) in the WoLA group were *very dissatisfied*, $p<0.001$.

Table 7. Pain Control Satisfaction.

Variable	LA Group n (%)	NLA Group n (%)	p value
Satisfaction with Pain Control			<0.001*
Very Dissatisfied	0 (0.0)	61 (96.8)	
Somewhat Dissatisfied	11 (17.5)	2 (3.2)	
Neutral	0 (0.0)	0 (0.0)	
Somewhat Satisfied	2 (3.2)	0 (0.0)	
Very Satisfied	50 (79.4)	0 (0.0)	

Data are expressed as numbers and percentage (%). Group LA: labor analgesia; Group WoLA: without labor analgesia; * significant.

To complement the quantitative outcomes, a photowalk methodology was employed to capture the visual and emotional dimensions of childbirth experiences. The “Before” and “After” photographs from both groups collectively portray two divergent yet complementary journeys - one from pain to relief and the other from endurance to natural recovery. Through both direct depictions and symbolic imagery, the photowalk captures recurring themes of satisfaction, resilience, safety, and emotional transformation across both groups.

Direct Emotional Transformation

The LA group photographs most vividly depict emotional transitions from visible pain and distress to expressions of calm, relief, and contentment after intrathecal analgesia. Figure 3 top line show an example of woman initially fatigued and tense, followed by serene radiant smiles and upright postures post-analgesia direct evidence of relief and satisfaction. Also, feature joyous moment shared by the mother, her newborn, and caregivers, symbolizing collective satisfaction following pain-free delivery. Photos not shown contrast exhaustion before analgesia with laughter and regained vitality after delivery, underscoring both emotional and physical recovery. Other photos capture a clear transition from tension and apprehension to openness and calm under a blue sky, symbolizing regained control and empowerment. In contrast, WoLA group photos depict satisfaction more subtly emerging after endurance rather than intervention. Figure 3 below portray a mother post-delivery, visibly relieved



Figure 3. Photowalk capturing direct emotional transformation across both groups.

and proud despite evident fatigue, suggesting fulfillment through natural effort. Photos transition from a scene of discomfort during contractions to quiet repose after childbirth, indicating emotional closure rather than analgesic relief.

Symbolic Representations of Relief and Recovery

In both groups, nature and environment serve as strong metaphors for emotional states and recovery. **Figure 4** top line show examples of photos including greenery, trees, and open fields to symbolize renewal and post-analgesic calm, representing relief from labor pain and restoration of energy. WoLA photos have similar imagery rising sunlight, flourishing trees, or calm landscapes but the symbolism shifts toward endurance, natural rhythm, and triumph over pain. Thus, while the LA group's symbolism reflects comfort and rejuvenation, the WoLA group's imagery conveys resilience, empowerment, and satisfaction derived from overcoming challenges.



Figure 4. Photowalk capturing symbolic representations of relief and recovery direct emotional transformation across both groups.

Infrastructure, Care, and Systemic Satisfaction

Both groups' photos also depict satisfaction indirectly through the healthcare environment, safety preparedness, and caregiving structures. In the LA group, post-analgesia photos show



Figure 5. Photowalk capturing infrastructure, care and systemic satisfaction across both groups.

organized wards, attentive caregivers, and functional safety measures illustrating trust, relief, and systemic support. In the WoLA group, satisfaction is represented through persistence within the same environment, emphasizing appreciation of care and natural coping within available resources. **Figure 5** shows that this comparison underscores that systemic satisfaction is not merely tied to pain relief but also to perceptions of safety, professional support, and institutional reliability.

DISCUSSION

This study combined quantitative assessment with qualitative photowalk analysis to compare maternal satisfaction between parturients who received intrathecal opioids with bupivacaine for labor analgesia (LA group) and those who did not receive labor analgesia (WoLA group). The integration of visual data through photowalk documentation provided a richer contextual understanding of the childbirth experience, highlighting both clinical outcomes and emotional narratives.

Labor contraction frequency and duration increased earlier and more robustly in the LA group (from 30 minutes onward), and total labor duration (first + second stage) was much shorter in LA versus WoLA (about 4.1 vs 8.6 hours, $p=0.001$). These results diverge from He & Wang, which report prolongation of labor, particularly the second stage, with epidural analgesia.¹² The difference may lie in technique (intrathecal vs. epidural), drug combination, and dose. The more efficient uterine activity in the LA group in this study suggests that analgesia may reduce stress-induced catecholamines, which otherwise can inhibit uterine contractility.

Maternal complications were significantly fewer in the LA group 25.4% vs WoLA 49.2%; $p<0.001$. Perineal tears were common in both groups but slightly fewer in LA; blood loss of ≥ 500 mL was more frequent in WoLA 15.9% vs LA 7.9% though not statistically significant ($p=0.271$). Neonatal outcomes also favored LA: APGAR scores at 1 and 5 minutes were significantly higher, and fewer fetal complications (e.g. birth asphyxia, hypoxia) occurred. These findings are consistent with meta-analyses showing that spinal/epidural opioids with local anesthetics do not significantly increase risk of low APGAR scores or severe neonatal adverse events when used appropriately, though some increase in minor side effects (respiratory depression, monitoring needed) has been reported.^{13,14}

Side-effect profiles were more in LA group reporting pruritus and vomiting, with a small incidence of post-dural puncture headache, while WoLA group had a much higher incidence of vomiting. The nature of side effects is comparable to what has been documented in the literature for intrathecal opioids (pruritus, nausea) and is considered acceptable relative to benefits.¹⁵ Quantitatively, satisfaction with pain control was significantly higher in the LA group compared to the WoLA group ($p<0.001$). In the LA group, 79.4% of participants reported being very satisfied, whereas 96.8% of those in the WoLA group were very dissatisfied. These findings reinforce the established efficacy of intrathecal analgesia in improving maternal comfort and satisfaction during labor.^{16,17}

The photowalk analysis complemented these numerical findings by revealing layered emotional and symbolic expressions of childbirth experiences across both groups. In the LA group, photographs vividly depicted a transition from visible distress to calmness, relief, and joy following analgesia administration. This direct emotional transformation, often characterized by open postures, smiles, and interaction with caregivers, provided visual confirmation of perceived pain relief and emotional well-being.

In contrast, photographs from the WoLA group reflected satisfaction emerging through endurance rather than pharmacologic intervention. Visual narratives showed fatigue and tension during labor followed by quiet repose, pride, and fulfillment after natural delivery. These images suggested that satisfaction without analgesia may derive from intrinsic resilience, maternal strength, and the psychological reward of overcoming pain.

Symbolic and environmental elements further deepened these insights. The LA group frequently used imagery such as greenery, open spaces, and natural light to represent renewal and post-analgesic tranquility. The WoLA group employed similar motifs, rising sunlight, flourishing trees, calm skies but with symbolism rooted in endurance, natural rhythm, and triumph over adversity. Together, these visual cues suggested that maternal satisfaction encompasses both physical relief and emotional recovery, albeit achieved through different pathways.¹⁸

Photographs also revealed systemic and infrastructural aspects influencing satisfaction. In the LA group, post-analgesia images highlighted organized wards, attentive staff, and visible safety measures, reflecting trust and perceived quality of care.¹⁹ In the WoLA group, satisfaction appeared linked to perseverance within the same environment, underscoring the importance of compassionate care and institutional support even in the absence of pharmacologic pain relief.²⁰

Cross-cutting themes of relief versus endurance, joy of motherhood, symbolism of recovery, and perceptions of safety emerged consistently across both groups. Collectively, these findings indicate that maternal satisfaction is a multi-dimensional construct shaped not only by analgesic efficacy but also by emotional, symbolic, and systemic factors.¹⁸

The qualitative-quantitative integration strengthens the interpretive validity of this study. The photowalk offered a novel lens to visualize emotional states, complementing statistical data with humanized context. However, interpretation of imagery remains inherently subjective, and cultural or personal factors may influence visual symbolism. Future studies may incorporate participatory photo elicitation interviews to validate thematic interpretations and deepen contextual understanding.

CONCLUSION

The combined quantitative and photowalk analyses demonstrate that intrathecal labor analgesia significantly enhances maternal satisfaction with pain control, producing both measurable and visually evident emotional relief. However, women who delivered without analgesia also experienced

meaningful satisfaction rooted in endurance, resilience, and the natural fulfillment of childbirth.

Intrathecal bupivacaine combined with opioids provides rapid and effective labor analgesia, enhances maternal and neonatal outcomes, and achieves high maternal satisfaction. It represents a safe and practical option for low-resource settings.

These findings highlight that maternal satisfaction extends beyond pain relief to include psychological adaptation, perceived safety, and quality of care. Integrating visual methodologies such as photowalks with conventional outcome measures provides a more holistic understanding of childbirth experiences and underscores the value of combining evidence-based clinical practice with empathetic, patient-centered care.

DECLARAÇÃO DE CONTRIBUIÇÃO / CONTRIBUTORSHIP STATEMENT

AAM: Conceptualização, metodologia, recolha de dados, investigação, validação, escrita do rascunho e revisão.

SSi: Conceptualização, metodologia, visualização, supervisão e edição.

JMB: Análise de dados e edição.

Todos os autores aprovaram a versão final a ser publicada.

AAM: Conceptualization, methodology, investigation, data collection validation, writing the original draft and reviewing.

SSi: Conceptualization, methodology, visualisation, supervision, and editing.

JMB: Data analysis and editing.

All authors approved the final version to be published.

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