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St. Paul's Hospital Millennium Medical College

Maternal Satisfaction with Labor Epidural Analgesia and Associated Factors among Mothers Delivering at SPHMMC, Addis Ababa

Investigator: Dr. Filimon Gidey (MD, Anesthesiology, Critical Care, and Pain Medicine Resident)

A Research Report Submitted to St. Paul's Hospital Millennium Medical College (SPHMMC) in Partial Fulfillment for the Requirement of Specialty Certificate of Anesthesiology, Critical Care, and Pain Medicine

March, 2026

SPHMMC, Addis Ababa



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March, 2026

SPHMMC, Addis Ababa

Approval Sheet

This is to certify that the research project proposal entitled “*Maternal Satisfaction with Labor Epidural Analgesia and Associated Factors among Mothers Delivering at SPHMMC, Addis Ababa*” submitted in partial fulfillment of the requirements for the specialty certificate training in Anesthesiology, Critical Care and Pain Medicine in SPHMMC and is recorded as original work carried out by Dr. Filimon Gidey.

The assistance and help received during the course of this work have been duly acknowledged. Therefore advisors recommends that it be accepts as fulfilling the requirements.

INVESTIGATOR

Dr. Filimon Gidey Signature _____ Date _____

ADVISORS

Dr. Misgana Tadesse Signature _____ Date _____

Dr. Kirubel Abebe Signature _____ Date _____

Acknowledgement

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Acronyms and abbreviations

AOR Adjusted Odds Ratio

COR Crude Odds Ratio

CS Cesarean Section

LEA Labor Epidural Analgesia

LMICs Low and Middle-Income Countries

SPHMMC St. Paul's Hospital Millennium Medical College

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Abstract

Background: Labor epidural analgesia (LEA) is commonly used for pain management during childbirth, and it is increasingly available in hospitals in Addis Ababa. However, studies examining maternal satisfaction and the factors associated with LEA are scarce in Ethiopia.

Objective: The main objective was to investigate the level of maternal satisfaction and associated factors among mothers who received LEA at St. Paul's Hospital Millennium Medical College (SPHMMC).

Methods: A hospital-based cross-sectional study was conducted on 230 mothers who received LEA for labor management at the SPHMMC. A consecutive sampling method was used to recruit participants. Data were collected using an electronically prepared structured questionnaire (Mackey Childbirth Satisfaction Rating). Data were analyzed using SPSS version 27, and the mean, median, frequency, and percentage were used to describe the data. The results are presented in tables and figures. Multivariable logistic regression was used to determine the factors associated with maternal satisfaction. A p-value < 0.05 was used to declare a statistically significant association, and an adjusted odds ratio was computed and presented with a 95% confidence interval.

Result: The overall maternal satisfaction with labor epidural analgesia was 75.2% (69.1% – 80.4%). This means that 24.8% of mothers were dissatisfied. Multivariable logistic regression analysis revealed that being in the age group of 25-30 and 31- 45 year (AOR = 4.77, 95% CI: 1.64 - 13.9), unplanned pregnancy (AOR= 5.88, 95% CI: 2.43 - 14.21), and experience of complications with LEA (AOR= 4.02, 95% CI: 1.48 - 10.92) significantly increased the odds of maternal dissatisfaction.

Conclusion: One in four mothers who received LEA were dissatisfied. Maternal satisfaction was significantly associated with age, pregnancy type, and complications related to LEA. Clinicians should consider these factors when recommending LEA. Strengthening protocols for early identification and management of complications is essential to improve satisfaction. Future multicenter and large-scale studies are recommended.

Keywords: Labor epidural anesthesia, maternal satisfaction, SPHMMC

1. Introduction

1.1. Background of the study

Labor pain is one of the most intense forms of pain experienced by women and is often described as a complex physiological and emotional process. It varies in intensity and perception among individuals, influenced by factors such as maternal age, parity, cultural beliefs, psychological preparedness, and the duration of labor (1,2). The management of labor pain is therefore a critical component of obstetric care, with the goal of ensuring a positive childbirth experience for mothers. Among the various pain management techniques available, epidural analgesia is considered the gold standard for labor pain relief due to its effectiveness in providing consistent and significant pain reduction while allowing the mother to remain awake and actively participate in the birthing process (3,4).

Epidural anesthesia is a method of neuraxial pain control in which anesthetic medications are injected into the epidural space to block sensory and motor spinal nerve roots in the thoracic, abdominal, pelvic, and lower extremity areas. It is widely recognized for its ability to provide reliable and adjustable pain relief during labor, making it a preferred option for many women globally (5,6). However, maternal satisfaction with labor epidural analgesia is not solely determined by the degree of pain relief but also by a range of other factors, including the mother's expectations, the quality of communication with healthcare providers, the perceived side effects, and the overall birthing experience (7).

In high-income countries, the use of labor epidural analgesia is well-established, and maternal satisfaction with this intervention has been extensively studied. However, in low- and middle-income countries, including Ethiopia, the utilization of epidural analgesia during labor remains limited due to factors such as resource constraints, lack of trained personnel, cultural norms, and limited awareness among mothers (8,9). In settings where epidural analgesia is available, understanding maternal satisfaction and the factors influencing it is crucial for improving the quality of care and addressing barriers to its effective implementation.

Therefore, this study aims to assess maternal satisfaction with labor epidural analgesia among mothers who delivered at SPHHMC and to identify the factors associated with their satisfaction. By exploring both the level of satisfaction and the determinants, this research will provide valuable insights into

the perceptions and experiences of mothers, contributing to the improvement of pain management services and maternal care in the hospital.

1.2. Statement of the problem

Effective pain management during labor is a critical component of maternal care, as unmanaged labor pain can lead to physical and emotional distress, negatively affecting the overall childbirth experience. Despite its availability of labor epidural analgesia in the hospital, there is limited data on how mothers perceive this service and the factors that influence their satisfaction.

While hospitals in Addis Ababa have begun offering LEA services, significant gaps persist:

Only 14% of eligible women opt for LEA despite 78% awareness (Hemen Medical Center, suggesting barriers beyond availability showing service implementation gap. Additionally, no studies in Ethiopia have systematically assessed maternal satisfaction with LEA or its determinants, unlike high-income countries where satisfaction rates exceed 85% (knowledge gap). Moreover, 82% dissatisfaction with general labor pain management was reported at Gandhi Memorial Hospital (2006), reflecting unmet needs that LEA could address if culturally adapted.

There is also health system challenges such as limited 24/7 anesthetist coverage (only 12% of hospitals), absence of standardized LEA protocols, and inadequate prenatal counseling on pain relief options.

Failure to address maternal dissatisfaction can have far-reaching implications, including negative experiences of childbirth, reduced trust in healthcare services, and reluctance to seek professional care in subsequent pregnancies. Understanding the level of maternal satisfaction and identifying the factors associated with it are thus critical for improving the quality of care, ensuring patient-centered services, and promoting positive childbirth experiences.

Given the limited research on maternal satisfaction with labor epidural analgesia in Ethiopia. Thus, the study aims to fill this gap by assessing the level of satisfaction among mothers delivered at SPHHMC and identifying the factors that influence their perceptions.

1.3. Significance of the study

Effective pain management during labor is a cornerstone of quality obstetric care and contributes significantly to a positive childbirth experience.

This study is significant for several reasons. First, it will provide evidence on the level of maternal satisfaction with labor epidural analgesia at SPHHMC, one of the few health facilities in Ethiopia offering this service. Such evidence is critical for evaluating the effectiveness and acceptability of labor epidural analgesia in the local context.

Second, by identifying the factors associated with maternal satisfaction, the study will provide insights into how healthcare providers can improve communication, service delivery, and the overall quality of care.

Third, the findings will help policymakers and healthcare administrators develop strategies to increase awareness and accessibility of epidural analgesia, addressing existing gaps in labor pain management.

2. Literature review

2.1. Definitions and conceptual framework

Labor epidural analgesia (LEA) is universally defined as the administration of local anesthetics or opioids into the epidural space to alleviate labor pain while preserving maternal consciousness. However, maternal satisfaction remains a contested concept, often measured through multidimensional scales encompassing pain relief efficacy, provider communication, and autonomy in decision-making (10). In high-income countries, satisfaction is closely tied to pain reduction ($\geq 80\%$ VAS score improvement), whereas in low-resource settings like Ethiopia, cultural perceptions of pain as a “rite of passage” complicate standardized definitions. This dissonance underscores the need for context-specific frameworks to evaluate satisfaction in Ethiopia’s hybrid healthcare system, where LEA access is nascent but expanding.

2.2. Global and local magnitude of the problem

Globally, 70–90% of women report satisfaction with LEA, with rates highest in high-income countries (85% in Australia) and lower in LMICs (66–80% in India and Cameroon) due to disparities in resources and training (11,12). In Ethiopia, only 14% of eligible women opt for LEA despite 78% awareness, and 82% express dissatisfaction with general labor pain management (13). This gap highlights systemic inequities: while Addis Ababa’s tertiary hospitals offer LEA, rural facilities lack even basic analgesia options, exacerbating urban rural divides in maternal healthcare quality.

2.3. Causes of low satisfaction: structural and perceived barriers

Three key barriers were **health system limitations, cultural narratives, and misinformation**. Only 12% of Ethiopian hospitals provide 24/7 anesthetist coverage. Delays in LEA administration (>30 minutes) reduce satisfaction by 40% (14). Pain is often viewed as spiritually meaningful, discouraging medical pain relief. Fears of paralysis or prolonged backache, though rare ($<1\%$ incidence), deter uptake. These factors intersect to perpetuate low LEA utilization despite clinical efficacy.

2.4. Risk Factors and Determinants of Satisfaction

Satisfaction is shaped by modifiable and non-modifiable factors: Timely LEA initiation (<30 min), absence of complications, Vaginal delivery (vs. C-section), and higher education level.

2.5. Methodological gaps and ethical considerations

Most studies rely on quantitative surveys (e.g., Likert scales), which overlook qualitative nuances like cultural stigma or provider-patient dynamics. Mixed-methods designs are optimal to capture both prevalence (what) and contextual drivers (why). Ethical challenges include ensuring informed consent in low-literacy populations and mitigating coercion in overburdened public hospitals. Pilot testing tools for cultural appropriateness, as done in Cameroon, is critical.

3. Objective

3.1. General Objective

The general objective is to assess maternal satisfaction with labor epidural analgesia and its associated factors among mothers who received LEA at SPHMMC.

3.2. Specific objectives

1. To determine the level of maternal satisfaction among mothers received LEA in SPHMMC
2. To identify the factors associated with maternal satisfaction among mothers received LEA in SPHMMC

4. Methods

4.1. Study area

The study was conducted in SPHMMC at Addis Ababa, Ethiopia's capital and largest healthcare hub. It is a tertiary level hospital providing multiple medical service to the Addis Ababa and referral center for patients from peripheral region of Ethiopia. In Addition to the medical service, the hospital is hub of medical education and research center.

4.2. Study Design

A hospital based cross-sectional study was conducted on mothers delivered at SPHMMC and received LEA to assess the level of maternal satisfaction.

4.3. Population

4.3.1. Source Population

The source population comprises all women received LEA at SPHMMC.

4.3.2. Study Population

The study population consists of women accessed during data collection period and meeting the inclusion criteria.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

The inclusion criteria includes all women delivered at SPHMMC and received LEA for labor pain management, gave live birth 28 weeks gestation, and willing to participate in the study.

4.4.2. Exclusion criteria

The exclusion criteria includes severe postpartum complications requiring ICU care, cognitive impairment affecting consent capacity.

4.5. Study variables

4.5.1. Dependent variable

- Maternal satisfaction with LEA

4.5.2. Independent variables

- Maternal age, educational status, parity, timing of LEA initiation, parturient expectations and preparation for LEA, adverse effects associated with LEA, labor outcome, and perceived cost of LEA.

4.6. Sample size determination

Sample size was calculated for each study objective using standard epidemiological formulas:

Table 1: Summary of sample size calculations by objective

Objective	Formula	Parameters	Calculation	Adjusted n
Satisfaction prevalence	$n = \frac{Z^2 pq}{d^2}$ $n = \frac{(Z_{\alpha} + Z_{\beta})^2}{(\delta/\sigma)^2} \quad \alpha=0.05, \beta$	p=0.5, d=0.05, Z=1.96	$\frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$	384
Factor detection		=0.2	For OR=1.8 detection	395

The largest required sample was 400 after adding 10% for non-response and adjusting for cluster effects. This provides 80% power to detect odds ratios 1.8 for satisfaction predictors at $p < 0.05$ significance.

However, using population correction formula and due to the issue of feasibility in time and budget the sample size is reduced to 230.

4.7. Sampling procedure

Consecutive sampling of eligible women post-LEA was undertaken until the final sample size achieved.

4.8. Data collection procedures

The validated Mackey Satisfaction Questionnaire was adopted to assess maternal satisfaction to LEA. The tool is simple to understand and administers in to local Ethiopian context and found valid by different language in different settings (15,16).

Three trained midwives administered the questionnaire surveys 24-48 hours postpartum. For those mothers accessed during data collection was made using face to face and additional mothers were reached through phone call.

4.9. Quality control measures

The questionnaire was pre-tested in 30 patients in SPHMMC and correction on the clarity and sequence of items were made before the actual data collection starts. Two days of training data collectors, and strict supervision by PI was made during data collection. The data sent to Google form were verified daily for its completeness.

4.10. Operational definitions

LEA Satisfaction: Score 8/10 on validated 10-point scale combining: Pain relief efficacy (VAS reduction 50%), provider communication quality, expectation fulfillment (17).

Timely Administration: Needle insertion 30 minutes from first Epidural analgesia request.

Adverse Events: Any complication documented in medical records requiring: Additional monitoring, pharmacological intervention, and specialist consultation.

4.11. Data management and analysis

Data were cleaned by checking for missing values, illogical entries, and outliers before analysis using SPSS version 27. The primary outcome variable—maternal satisfaction with labor epidural analgesia—was derived from responses to the item: "I received excellent pain relief after receiving LEA." Consistent with the operational definitions, responses were dichotomized as satisfied (those who responded "agree" or "strongly agree") and dissatisfied (those who responded "neutral," "disagree," or "strongly disagree").

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were computed to summarize the socio-demographic characteristics, obstetric history, and LEA-related experiences of participants.

To identify the associated factors first bivariate logistic regression was conducted between each independent and dependent variable. Variables with a p-value of < 0.25 were entered in to multivariable logistic regression model to examine if they might been associated in multivariable analysis. Consequently, those variables statistically significant at p-value below 0.05 were included in the final model. Adjusted odds ratio with its 95% CI were presented.

4.12. Ethical Considerations

Ethical clearance was obtained from the institutional review board (IRB) of SPHMMC (Ref #2025-LEA-01) before commencing data collection. Additionally, written informed consent was obtained

from each study participants. The purpose of the study was explained and the right to withdraw at any time from the study was assured.

5. Result

5.1. Socio-demographic characteristics

This study enrolled 230 mothers who received Labor Epidural Analgesia at SPHMMC. The mean age of study participants was 28 years, with a standard deviation of 4.96. The majority of study participants (43.5%) were between 25 and 30 years of age, married (90%), had a high school education (grade 9-12th), and lived in Addis Ababa (66.5%) (Table 2).

Table 2: Socio-demographic characteristics of the study participants

Variable	Category	Frequency	Percent
Age (year)	18 – 24	53	23.0
	25 – 30	100	43.5
	31- 45	77	33.5
Marital status	Divorced	4	1.7
	Married	207	90.0
	Single	17	7.4
	Widow	2	9
Level of education	Grade 8 or less	57	24.8
	Grade 9-12	87	37.8
	No formal education	6	2.6
	Tertiary education	80	34.8
Residence	Addis Ababa	153	66.5
	Outside Addis Ababa	77	33.5

5.2. Obstetric history of the study participants

The obstetric history revealed that the majority of the mothers were nulliparous (54.3%), had planned pregnancies (80.4%), had deliveries attended by obstetrics residents (61.3%), and underwent spontaneous vaginal deliveries (62.6%) (**Table 3**). Additionally, cervical dilation at the initiation of LEA was less than 3 cm in 73.9% of cases. The time elapsed between the request and administration of LEA in most of the study participants was typically 30-60 minutes (57.4%). Only 9.1% of mothers experienced LEA-related complications, and 69.6% perceived LED costs as fair (**Table 4**).

Table 3: Obstetric history of the study participants, SPHMMC, 2026

Variable	Category	Frequency	Percent
Parity	Multiparous	105	45.7
	Nulliparous	125	54.3
Planned pregnancy	No	45	19.6
	Yes	185	80.4
Delivery attendant	Midwife	89	38.7
	Obstetrics resident	141	61.3
Mode of delivery	Emergency C/S	63	27.4
	Instrumental delivery	18	7.8
	Spontaneous vaginal delivery	149	64.8

Table 4: Labor Epidural Analgesia experience, SPHMMC, 2026

Variable	Category	Frequency	Percent
Cervical dilation at LEA initiation (cm)	≤ 3 cm	170	73.9
	4 - 10 cm	60	26.1
Time between request and LEA administration	< 30 minutes	30	13.0
	30 - 60 minutes	132	57.4
	> 60 minutes	68	29.6
Complications related to LEA	No	209	90.9
	Yes	21	9.1
Perceived cost of LEA	Cheap	4	1.7
	Fair	160	69.6
	Expensive	66	28.7

5.3. Level of maternal satisfaction to LEA

Eight items on a five-point Likert scale were administered to assess mothers' satisfaction with labor epidural anesthesia. Figures 1 and 2 present the overall satisfaction and the status of receiving excellent pain relief after LEA, respectively. As shown, 47.4% of participants strongly agreed,

while only 4.3% responded with strong disagreement to the item assessing overall satisfaction with the LEA experience (**Figure 1**).

Overall satisfaction with LEA

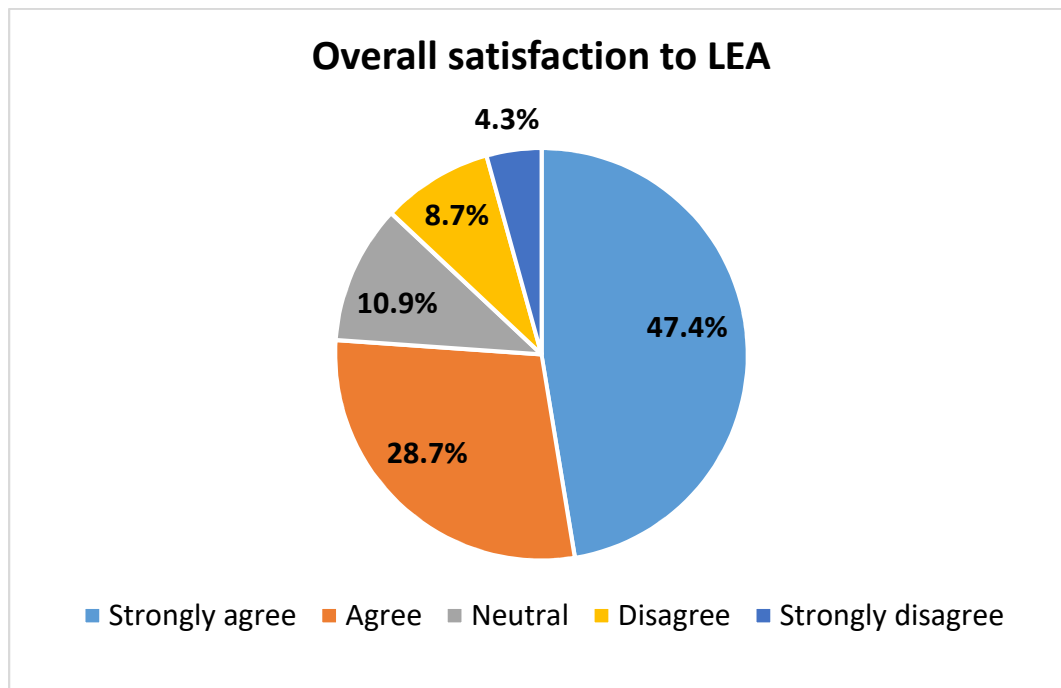


Figure 1: Overall maternal satisfaction with labor epidural analgesia in SPHMMC, 2026

Additionally, 43% of mothers strongly agreed, and 32.2% agreed that they experienced pain relief after receiving LED treatment (Figure 2).

Furthermore, participants' responses to the item "I received excellent pain relief after receiving LED" were categorized as "yes" if they answered strongly agree or agree, and as "no" if they responded with neutral, disagree, or strongly disagree. Consequently, 24.8% of mothers reported being dissatisfied or did not experience excellent pain relief after LED administration.

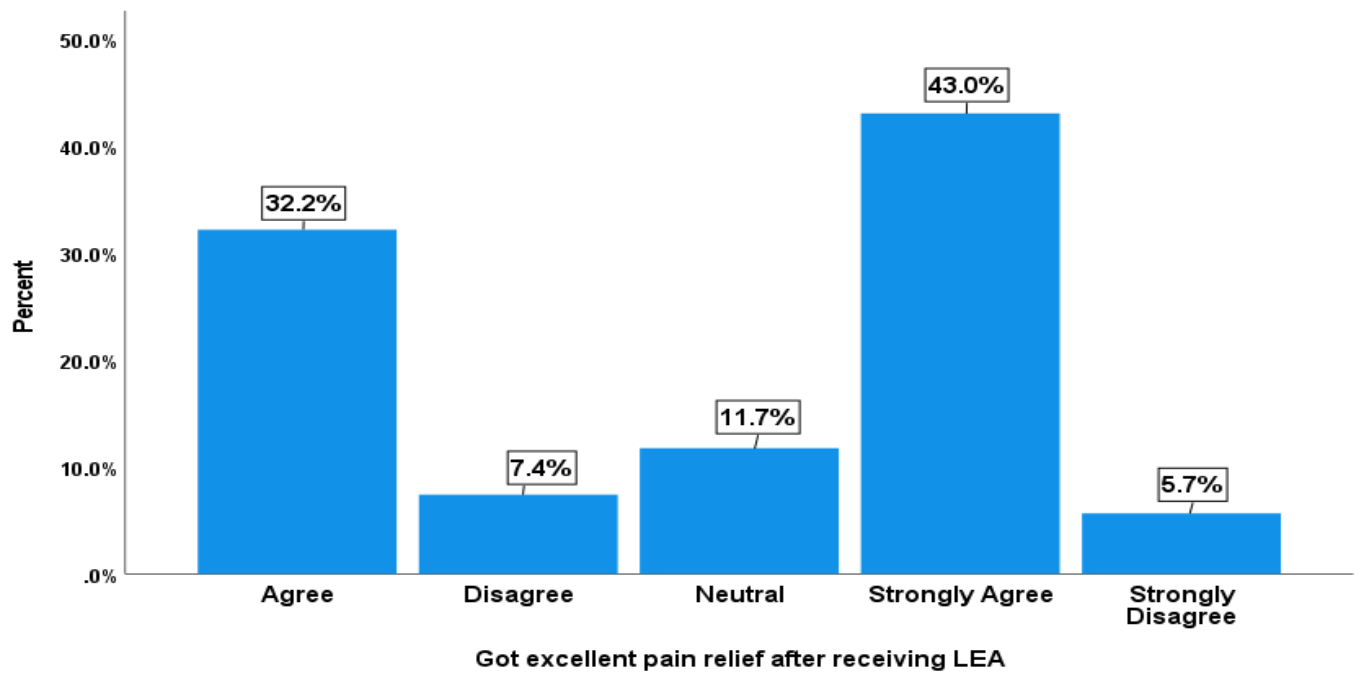


Figure 2: The number of mothers receiving excellent pain relief after receiving LEA, 2026

The frequency distribution of remaining items used for assessment of maternal satisfaction is presented in table 5.

Table 5: Frequency distribution of items used to assess maternal satisfaction to LEA, SPHMMC

S. N	Items	Satisfied		Not satisfied	
		Frequency	%	Frequency	%
1.	Overall, I am satisfied with my LEA experience	175	76.1	55	23.9
2.	I received excellent pain relief after receiving LEA	173	75.2	57	24.8
3.	The effect of epidural was less than I expected	44	19.2	186	80.8
4.	The effect of epidural met or exceeded my expectations	137	59.6	93	41.4
5.	I received sufficient information about LEA	184	80	46	20
6.	I felt well-informed to make decisions about LEA	193	83.9	37	16.1
7.	I understood the possible complications of LEA	186	80.9	44	19.1
8.	LEA was administered promptly after my request	187	81.3	43	18.7

Satisfied (Strongly disagree and agree): Not satisfied (Disagree, neutral, agree, and strongly agree)

Overall birth experience

Regarding the overall birth experience, the majority of mothers agreed that the labor ward provided privacy (40%), was clean (33.5%), and was treated with politeness and respect (42.2%). Additionally, mothers strongly agreed on the clarity of communication with healthcare staff (41.3%) and the appropriate addressing of their concerns (**Table 6**).

Table 6: Frequency distribution of items used to assess the overall birth experience of mothers underwent LEA, SPHMMC, 2026

S. N	Items	Satisfied		Not satisfied	
		Frequency	%	Frequency	%
1	The labor ward provided adequate privacy	177	77	53	23
2	The labor ward was clean and hygienic	156	67.8	74	32.2
3	I was treated politely and with respect	186	80.9	44	19.1
4	The healthcare staff communicated clearly	190	82.6	40	17.4
5	My concerns were addressed appropriately	185	80.4	45	19.6

Satisfied (Strongly disagree and agree): Not satisfied (Disagree, neutral, agree, and strongly agree)

5.4. Factors associated with maternal satisfaction to LEA

Bivariate logistic regression was used to identify factors eligible for the multivariable logistic regression analysis. Variables with a p-value less than 0.25 were included in a backward multivariable logistic regression model to assess the potential for significant association. Based on this variable selection criterion, six variables were deemed eligible for the multivariable analysis. These variables included age, marital status, planned/unplanned pregnancy, time interval between LEA request and administration, complications, and perceived cost of LEA (**Table 7**).

Table 7: Bivariate analysis of factors associated with satisfaction (pain relief) after receiving LEA, SPHMMC, 2026

Factors	Category	Maternal satisfaction after receiving LEA (Yes = 0, No = 1)		
		COR	95% CI	P-value
Age (year)	18-24	Ref	-	-
	25-30	1.99	0.87 - 4.61	0.105
	31-45	1.6	0.66 - 3.88	0.297
Marital status	Married	Ref	-	-
	Unmarried	4.82	1.98 - 11.72	< 0.001*
Pregnancy occurrence	Planned	Ref	-	-
	Unplanned	4.64	2.32 - 9.28	< 0.001*
Time between LEA request and administration	< 30 minutes	Ref	-	-
	> 60 minutes	0.41	0.16 - 1.06	0.067
	30 - 60 minutes	0.58	0.25 - 1.33	0.198
Experience any complications with LEA	No	Ref	-	-
	Yes	3.89	1.56 - 9.75	0.004*
Perceived cost of LEA	Cheap	Ref	-	-
	Expensive	0.28	0.04 - 2.06	0.211
	Fair	0.44	0.06 - 3.31	0.421

Ref: Reference category, **COR:** Crude Odds Ratio

Multivariable logistic regression analysis revealed that age, type of pregnancy occurrence, and experience of complications related to LED were significantly associated with maternal satisfaction to LED. The result is interpreted as follows:

Mothers aged 25 to 30 were 4.7 times more likely to be dissatisfied with LED than those aged 18 to 24, holding other variables constant (AOR= 4.77, 95% CI: 1.64 - 13.9). Similarly, the odds of maternal dissatisfaction with LED among women who had an unplanned pregnancy were approximately six times higher than among women with a planned pregnancy, holding other variables constant (AOR= 5.88, 95% CI: 2.43 - 14.21). Furthermore, mothers who experienced any complications related to LEA were four times more likely to be dissatisfied with LED, holding other variables constant (AOR= 4.02, 95% CI: 1.48 - 10.92) (**Table 8**).

In plain language, being in the older age group, the occurrence of unplanned pregnancy, and experiencing any complication related to LED lowers maternal satisfaction, or failure to get excellent relief following receipt of LED.

Table 8: Multivariable logistic regression analysis of factors associated maternal satisfaction after receiving LEA, SPHHMC, 2026

Factors	Category	Maternal satisfaction after receiving LEA (Yes = 0, No = 1)		
		AOR	95% CI	P-value
Age (year)	18-24	Ref	-	-
	25-30	4.77	1.64 - 13.9	0.004*
	31-45	3.58	1.17 - 10.95	0.025*
Marital status	Married	Ref	-	-
	Unmarried	2.86	0.99 - 8.26	0.052
Pregnancy occurrence	Planned	Ref	-	-
	Unplanned	5.88	2.43 - 14.21	< 0.001*
Experience any complications related LEA	No	Ref	-	-
	Yes	4.02	1.48 - 10.92	0.006*

*Ref: Reference category, AOR: Adjusted Odds Ratio, *significantly associated at p-value < 0.05*

6. Discussion

Although LEA is a widely used technique for pain management during labor and delivery, the overall practice of labor epidural analgesia in Ethiopia is still suboptimal (18,19). Aside from the lack of continuous supply of the drug and training, maternal satisfaction with LEA might affect its routine use. However, studies examining the level of satisfaction of mothers and associated factors towards LEA are scarce, particularly in low-income countries. Therefore, this study aimed to investigate the level of maternal satisfaction and associated factors among mothers who received LEA at St. Paul's Hospital Millennium Medical College. The results showed that approximately one-quarter of mothers were dissatisfied or did not experience excellent pain relief after LEA administration. Additionally, maternal age, type of pregnancy (planned/unplanned), and experience of any complications related to LEA were significantly associated with maternal satisfaction with LEA.

The overall satisfaction rate of 75.2% (95% CI: 69.1% – 80.4%) in this study indicates that the majority of mothers found LEA effective in managing labor pain. This result is consistent with findings from other studies conducted in similar settings in Tikur Anbesa Specialized Hospital, which report maternal satisfaction with LEA 83% (20). However, it is slightly lower than a study conducted at Hemen Maternal and Child Health Center in Addis Ababa, which showed that about 98% of parturients who took LEA were satisfied with the overall experience of LEA they took and the pain control (21). The discrepancy of the result may be attributed to the fact that, in the private clinics, there may be a better quality of care characterized by adequate supply of drugs, routinely treated by senior physicians, differences in the wealth status of study participants, and differences in the operational definition of maternal satisfaction by the two studies. In addition to the above explanation, satisfaction with labor analgesia is influenced by factors such as effective pain relief, communication with healthcare providers, and the mother's expectations of the procedure. However, the 24.8% dissatisfaction rate highlights areas for improvement in the quality of care, patient communication, and management of side effects or complications related to LEA.

The study found maternal age to be a significant factor influencing satisfaction with LEA. This might be because older mothers may have had previous childbirth experiences without epidural analgesia, which could shape their expectations. If their past experiences involved minimal or no pain management, they may have higher expectations for the epidural's effectiveness and are more likely to feel dissatisfied. Older mothers might experience more complex or prolonged labor due to age-related factors, such as reduced uterine contractility or associated comorbidities (e.g., hypertension

or diabetes). These complications could result in less effective pain relief or higher overall discomfort, leading to dissatisfaction with the analgesia. Pain perception and tolerance can vary with age, and older mothers might have a lower pain threshold or different responses to analgesics compared to younger mothers. However, previous studies did not report the association between age and maternal satisfaction, which may need further studies to understand the link. Overall, the finding underscores the importance of providing tailored education and support to older-age mothers to address their specific concerns and expectations.

Mothers with unplanned pregnancies were more likely to report higher dissatisfaction with LEA compared to those with planned pregnancies. This might be due to planned pregnancies being often associated with better emotional preparedness, higher levels of antenatal care utilization, and a greater likelihood of discussing labor pain management options with healthcare providers. In contrast, unplanned pregnancies may be associated with higher levels of prenatal stress and reduced engagement with prenatal care services, which could negatively impact satisfaction. This suggests the need for targeted interventions to support mothers with unplanned pregnancies, including counseling and education about labor pain management options.

Importantly, the experience of complications related to LEA significantly reduced maternal satisfaction. Common complications, such as headaches, hypotension, or inadequate pain relief, can negatively impact the mother's experience and perception of the procedure. This finding highlights the critical need for healthcare providers to minimize complications through careful patient selection, adherence to clinical protocols, and prompt management of adverse effects. Additionally, effective communication about the potential risks and benefits of LEA can help manage maternal expectations and improve overall satisfaction. The association between the experience of LEA complications and maternal satisfaction has been reported in a previous study conducted at Tikur Anbesa Hospital (20). Similarly, our study results are consistent with a study of 10,146 parturients in Singapore, which found that post-procedure complications such as headache, backache, urinary retention, and neural deficit were associated with maternal dissatisfaction (22).

The results of this study have several clinical implications. The findings of this study have important implications for improving maternal satisfaction with labor epidural analgesia at St. Paul Hospital Millennium Medical College and similar settings. First, healthcare providers should prioritize patient education about LEA, including its benefits, risks, and expected outcomes, to ensure informed decision-making and realistic expectations. Second, efforts should be made to enhance the quality of care, including staff training, adherence to evidence-based protocols, and the availability of resources to manage complications effectively. Third, targeted support should be provided to younger mothers

and those with unplanned pregnancies to address their specific concerns and improve their labor and delivery experiences.

6.1. Limitation of the study

The cross-sectional design limits the ability to establish causal relationships between maternal satisfaction and the associated factors. Additionally, the study was conducted in a single institution, which may limit the generalizability of the findings to other hospital settings. Future research should explore maternal satisfaction with LEA in a broader context, including different healthcare facilities and diverse populations to validate and expand upon these findings.

7. Conclusion and recommendation

7.1. Conclusion

Overall, this study highlights that one in four mothers who received labor epidural anesthesia at the study hospital were not satisfied with it. Maternal satisfaction was significantly associated with maternal age, pregnancy type, and complications related to LEA.

7.2. Recommendation

Based on the conclusion sets of recommendations are forwarded to each concerned body as follows.

For physicians and midwives:

- **Personalize pain management plans:**
 - Consider maternal age, pregnancy type (e.g., planned versus unplanned), and any potential risk factors when recommending LEA.
- **Monitor and manage complications:**
 - Strengthen protocols for early identification and management of complications related to LEA.
- **Develop Patient-Centered Care Protocols:**
 - Implement standardized protocols to assess maternal preferences and pain management needs before and during labor.
- **Feedback Systems:**

- Establish mechanisms (e.g., surveys, interviews) to collect feedback on maternal satisfaction with LEA and use this data to guide quality improvement initiatives.
- **Resource Allocation:**
 - Ensure adequate staffing and equipment to minimize delays or errors in administering LEA.

For policymakers:

- **Promote awareness campaigns:**
 - Launch public health campaigns to educate pregnant women about pain management options, including LEA, to empower informed decision-making.
- **Standardize guidelines:**
 - Develop national or regional guidelines for administering LEA that account for maternal age, pregnancy type, and risk factors to ensure consistent care.
- **Mandate quality assurance measures:**
 - Require hospitals to implement maternal satisfaction metrics as part of routine quality assurance processes.

Future researchers

- Further multicenter and large sample size including private clinics
- Triangulation with qualitative study to deeply explore barriers of maternal satisfaction is needed.
- Interventional study that evaluates the effect of pre-LEA education on maternal satisfaction is warranted.

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Annexes

Annex-1: Information sheet

Introduction: Thank you so much. My name is _____. I am doing this on behalf of St. Paul Hospital Millennium Medical College for the research project entitled “*Maternal Satisfaction with Labor Epidural Analgesia and Associated Factors among Mothers Delivered at SPHHMC, Addis Ababa*”

Question: Please can you tell me why you come to this health facility?

This is a research project on **Maternal Satisfaction with Labor Epidural Analgesia and Associated Factors among Mothers Delivered at SPHHMC, Addis Ababa**. LEA is the gold standard method of labor pain management. We are going to give you information about the research project and invite you to be part of it. You may take some time to decide whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with regarding participation in the research.

Purpose of the research: The purpose of this research is to assess the level of Maternal Satisfaction with Labor Epidural Analgesia and Associated Factors among Mothers Delivered at SPHHMC, Addis Ababa

Participation: We are asking you and others to voluntarily participate in this study because you are a food handler working in feeding center of primary schools in Addis Ababa. Our study is completely interview-based and does not involve any invasive procedure.

Confidentiality: Any information that we collect about you during this research will be kept confidential. Information about your identity will be put away after re-coding your file and kept in a secure place. Only the principal investigator will be able to link your identity with the code number. However, all other information, which is devoid of your identity, may be seen by the researchers; and if needed by ethics committees.

Benefits: The study does not have direct benefits for you but we need to find the answer to the research question which in turn benefits to support efforts made to ensure occupational health safety of healthcare workers.

Risks: The study has no risk for the participants and interviews will be conducted in a private, dedicated office for the study.

Inducement, incentive, and compensation: This study process has no form of inducement, or coercion and the study does not bring any risks that incur compensation.

Results dissemination: The researcher is responsible for the dissemination of findings in different seminars and conferences. Moreover, the finding will be published in a scientific reputable journal and shared on social media.

Right to refuse or withdraw: You do not have to take part in this research if you do not wish to do so and refusing to participate will not affect your treatment at this hospital or clinic in any way. You will still have all the benefits that you would otherwise have at this health center or hospital.

You may stop participating in the research at any time you wish without losing your rights as a patient here. Your treatment at this clinic will not be affected in any way.

Person to contact: You have the right to ask for information that is not clear about the research context and content before and or during the research work. If you have any questions, please ask or contact the persons below.

If you have any further questions and in case of urgency you can contact

Dr. Filmon Gidey (Principal investigator) (Tel. 09-10-69-07-54)

Advisor: Dr. Misgana Tadesse (MD, Assistant Professor of Anesthesiology, Critical Care and Pain Medicine) (Tel. 09-

Institutional Review Board: Address: @ St. Paul Hospital Millennium Medical College, School Of Public Health.

Annex-2: Informed consent

Title of the project: Maternal Satisfaction with Labor Epidural Analgesia and Associated Factors among Mothers Delivered at SPHHMC, Addis Ababa.

I, the undersigned, confirm that, as I give consent to participate in the study, it is with a clear understanding of the objectives and conditions of the study and with recognition of my right to withdraw from the study if I change my mind.

I _____ do hereby give consent to **Mr. /Mrs./Miss**

_____ to include me in the proposed research. I have been given the necessary information about the research. I have also been assured that I can withdraw my consent at any time without penalty or loss of benefits. The proposal has been explained to me in the language I understand.

Are you willing to participate in the study?

Yes ☐ No ☐ (Terminate the interview and say thank you)

Name of the participant: _____

Name of interviewer: Dr/Mr./Mrs./Miss: _____ Signature _____ Date: ____/____/____

Supervisor: Dr/ Mr. /Mrs./Miss: _____ Signature: _____ Date: ____/____/____

Annex-3: Questionnaire

1. Socio-demographic Characteristics

Question	Response Options
1.1 How old are you?	_____
1.2 Marital Status	I. Single II. Married III. Divorced IV. Widow
1.3 Highest education level	I. No education II. Grade 8 or less III. Grade 9-12 IV. Tertiary education
1.4 Where do you live	I. Addis Ababa II. Outside Addis Ababa

2. Past Obstetric History

Question	Response Options
2.1 Parity	I. Nulliparous II. Multiparous
2.2 Is the pregnancy planned	I. Yes II. No
2.3 Who attended your current delivery?	I. Midwifery II. Obstetrician

2.4 Mode of delivery	I. Spontaneous vagi-nal delivery II. Instrumental de-livery III. Emergency C/S
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3. Satisfaction with LEA and Related Factors

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3.1.1 Overall satisfaction with LEA experience -					
3.1.2 Received excellent pain relief after LEA					
3.2.1 Epidural effect less than expected					
3.2.2 Epidural effect met or exceeded expectations -					
3.2.3 Received sufficient information about LEA					
3.2.4 Received needed information for decision-making					
3.2.5 Understood possible complications					
3.2.6 LEA administered within 30 minutes					

Question	Response Options
3.2.7 What do you think is the cost of LEA?	I. Cheap II. Fair III. Expensive
3.2.8 Experienced complications with LEA?	I. Yes II. No
3.2.9 Cervical dilatation at LEA initiation (cm)	_____

4. Satisfaction with Parturition Process

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3.3.1 Labor ward had freedom and privacy					
3.3.2 Labor ward was clean					
3.3.3 Treated politely by healthcare staff					
3.3.4 Partner/family were supportive					