



## Cross-sectional Study

# Perioperative patient satisfaction and its predictors following surgery and anesthesia services in North Shewa, Ethiopia. A multicenter prospective cross-sectional study

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## ARTICLE INFO

## Keywords:

Anesthesia

Leiden preoperative care patient satisfaction

questionnaire (LPPSQ)

Patient satisfaction

Perioperative anesthesia service

## ABSTRACT

**Introduction:** Patient satisfaction is a relative and complex concept, that mainly depends on the balance between patient's expected and perceived quality of care. Measuring patient satisfaction is important to assess the continuous quality and improvement in anesthesia services, highly affected by anesthetist patient interaction, perioperative anesthetic management and postoperative follow up. The aim of this study was to assess perioperative adult surgical patient satisfaction and its predictors following surgery and anesthesia services in three general Hospitals in a low income country.

**Methods:** Multicenter prospective cross-sectional study was conducted in all general hospitals found in North Shewa Amhara Regional State hospitals from February to April 2021. After obtaining ethical approval from the institutional review board, 411 willing patients have participated in this study. Data was collected by chart review and face-to-face questions after 24 h of the postoperative period. The level of patient satisfaction was measured via a 5-point Likert scale. Descriptive statistics were presented in frequency and percentage. Both bivariate and multivariate logistic regression models were fit to identify the variables, which had an association with the outcome variable. P-values < 0.2 for bivariate and < 0.05 for multivariate and adjusted odds ratio were used to consider statistically significant. This study is registered with research unique identifying number of "researchregistry7502".

**Result:** Among 411 participants with a response rate of 96.9%; 61.8% were females and 54.7% had surgery under spinal anesthesia. The overall patient satisfaction was 64%. History of anesthesia exposure, premedication, spinal anesthesia and postoperative pain were predictive factors for patient satisfaction after perioperative anesthesia service with AOR (95% CI) P value of 2.311(1.244–4.294)0.008, 2.213(1.277–3.835) 0.005, 2.707(1.458–5.029) 0.002 and 2.430(1.452–4.065) < 0.001 respectively.

**Conclusion:** In general the overall patient satisfaction towards perioperative anesthesia service was low in contrast to many previous studies. Factors that cause dissatisfaction should be prevented or better treated and every stakeholder should be trained and participated.

## 1. Background

Patient satisfaction is a complex concept, depends on the subjective judgment of a patient, and is affected by many factors such as the socioeconomic standard, demographic data, cultural level, patients'

preferences, cognitive ability of the patients, past experiences, and quality of the tool used [1–4].

Measuring patient satisfaction is vital to assess the quality of care and its improvement in perioperative anesthesia services, highly affected by anesthetist patient interaction, perioperative anesthetic management

**Abbreviations:** ASA, American Society of Anesthesiologists; GA, General Anesthesia; LPPSQ, Leiden Perioperative care Patient Satisfaction Questioner; SA, Spinal Anesthesia; STROCSS, Strengthening The Reporting of Cohort, Cross-sectional and Case-control studies in Surgery.

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<https://doi.org/10.1016/j.amsu.2022.103478>

Received 1 January 2022; Received in revised form 2 March 2022; Accepted 6 March 2022

Available online 12 March 2022

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and postoperative follow up [1–5], used to evaluate the quality of care in the eyes of the recipients and also to redesign or formulate an established standard of care to improve the quality of services. Anesthetists play a great role in preoperative evaluation, intraoperative management, and treatment of postoperative adverse effects [1,6].

Patient satisfaction is a burning issue in the current arena of medicine and well accepted measure of quality of health care [7]. Which is affected by many perioperative factors including communication skills with the patient, adequacy of information given in the preoperative period, sympathy towards the client while they are under stress, type of anesthesia, perioperative nausea & vomiting, intraoperative awareness, duration of surgery and also immediate postoperative pain are some of the determinant factors for perioperative patient satisfaction [1,2,6,8–10].

Besides, the overall level of patient satisfaction following anesthesia service reported in various parts of the world ranges from 56.5 to 99.1% [1,6,9,11], which has large gaps between studies. Some studies in Ethiopia showed that the level of patient satisfaction is below the standard based on the Leiden preoperative care patient satisfaction tool [6,8,9].

Having sufficient data related to patient satisfaction is assumed to improve and understand its strengths and to target areas in which performance is insufficient and it provides an opportunity for the improvement or change of the identified gaps [1,5,12]. Furthermore, in the future, payment for health care services will likely depend in part on the degree of patient satisfaction [13]. Studies reveal perioperative patient satisfaction following anesthesia service and all the negatively associated factors can be minimized [9,14]. According to some studies, factors compromising patient satisfaction indicate an urgent need of safety and quality guidelines or protocols in the service of anesthesia [9], which needs baseline study. The aim of this study was to assess perioperative adult surgical patient satisfaction and its predictors following surgery and anesthesia services in three general Hospitals in a low income country.

## 2. Methodology

The study was conducted in three selected general hospitals of North Shewa Zone, Amhara regional state, Ethiopia, between February and April 2021. After study approval from ethical review board of Debre Berhan University, oral informed consent was obtained from each study subject after a clear explanation about the objective of the study and their right to refuse to participate in the study at any time. Patients discharged before 24 h of the postoperative period, seriously ill, unable to communicate, patient refusal and age <18 year were excluded. The sample size was calculated based on 50% patients will be satisfied with anesthesia services at a 5% margin of error due to the absence of reliable previous study in the study area, with the addition of 10% for non-response rate the total sample size was 424. Finally, 411 were found to fulfill the inclusion criteria and thus were included in data analysis. This study is registered with a research unique identifying number of 7502/h <https://www.researchregistry.com/browse-the-registry#home> and reported in line with STROCSS 2021 [15].

### 2.1. Data collection procedure

Amharic and English version questioner was used in data collection; pre-taste was done on 5%(22) patients of the sample size. Data were collected by six trained anesthetists with face to face interview and review of documentation by using a structured questionnaire consisting of socio-demographic variables, preoperative-related factors, and intra and post-operative anesthesia-related factors, patient experience, and items of patients' satisfaction will be assessed by adopting Leiden perioperative care patient satisfaction questionnaire (LPPSQ) at 24 h after surgery. Data were collected electronically using kobo toolbox after ethical clearance was obtained from Ethical review board of Debre Berhan

University and oral informed consent from each participant. LPPSQ is an acceptable tool to measure perioperative patient satisfaction following anesthesia services and is suitable for research purpose [16] using 20 questions (items of information, fear and concern and also staff patient relationship with 5, 4 and 11 questions each respectively). Even though the questionnaire allows assessing professional competence and services and also prevalence of undesirable anesthetic outcomes they are not included here. The responses of satisfaction questionnaire were a five point Likert scale with a replay of completely 'dissatisfied', 'dissatisfied', 'neutral', 'satisfied' and 'completely satisfied' and also 'not at all', 'a little bit', 'moderately', 'quite a bit' and 'extremely' for information and staff patient relationship and fear & concern respectively.

### 2.2. Data analysis

Data were automatically checked for completeness and consistency because we used electronic data collection using kobo toolbox then directly imported, cleaned, coded and analyzed using SPSS version 26. Descriptive statistics were computed to determine frequencies and summary statistics (mean, standard deviation, median, IQR and percentage as appropriate). Data were presented using tables and graphs. All variables with  $P \leq 0.2$  in the bivariable logistic regression analysis were included in the final model of multivariable logistic regression analysis to control all possible confounders. Multi-collinearity was checked to see the linear correlation among the independent variables by using the standard error, variance inflation factor and tolerance test. Model fitness was checked with the Hosmer-Lemeshow test. The adjusted odds ratio with 95% CI was estimated to identify the factors associated with adherence status using multivariable logistic regression analysis. A p value < 0.05 was considered statistically significant. Patient satisfaction with a five-point Likert scale (adapted from the Leiden Perioperative care Patient Satisfaction questionnaire (LPPSQ) was dichotomized as satisfied and dissatisfied based on the demarcation threshold formula.

### 2.3. Operational definitions

Perioperative satisfaction:- patients considered to be satisfied scored greater than or equal to the cut point based on the demarcation threshold formula.

$$\text{Demarcation threshold formula} = \frac{\text{Total highest score} - \text{Total lowest score}}{2} + \text{Total-lowest-score}^{1,2}$$

Where Likert scales (1 = completely dissatisfied, 2 = dissatisfied, 3 = Neutral, 4 = satisfied and 5 = completely satisfied).

Intraoperative awareness:- A recalled event occurring during anesthesia/surgery that was confirmed (or otherwise) by the attending personnel present in the operating room was considered as awareness [17].

Hypotension:- A decrease in mean arterial pressure 20% from baseline and **bradycardia** is defined as a decrease in heart rate of 20% from baseline [18,19].

Postoperative depression:- Defined as having unexplained feelings of sadness and hopelessness after surgery [9].

Postoperative sore throat:-When the patient experiences pain during swallowing (liquid or solid food) or develops hoarseness of voice within 24 h after operation among those patients who managed with general anesthesia with tracheal intubation [9].

Post dural puncture headache:-is defined as a frontal and/or occipital headache that appears after lumbar puncture, which is worsening within 15 min of assuming the upright position, improves within 30 min of resuming the recumbent position [20].

Needle prick pain:-is defined as sudden and sharp pain accompanying needle puncture, and paresthesia is defined as an uncomfortable

pain accompanying needle [21].

A failed block:-is defined as the need to repeat the spinal anesthesia and at least analgesia was needed to proceed surgical procedure [21].

Adult: - according to the Merriam Webster defined as a mature, fully developed person, reached the age when they are legally responsible for their actions.

### 3. Result

#### 3.1. Socio-demographic characteristics of study participants

A total of 411 patients were enrolled (Fig. 1), of which 157 were male and 254 female with a male to female ratio of 1:1.6 (Table 1). The median age and interquartile range were 31 and (26–43) years respectively, with a range of (18–83) years (Table 1).

The majority of study participants had an educational level of secondary or higher education, from which 31% of them were attained higher education (as shown in Table 1).

#### 3.2. Preoperative and anesthesia related factors

Among study participants, only 394(95.3%) were visited by the anesthetist in the preoperative period from which 367(93.1%) reported that the anesthetists addressed their questions. Only 97(23.6%) of study patients had a history of previous anesthesia exposure in which 90 of them were exposed to spinal anesthesia. Of the total participants 244 (59.4%) were ASA II in addition 133(32.4%) and 34(8.3%) were ASA I and ASA III respectively, Fig. 2. In addition to this only 79(19.2%) of participants had comorbid illness of which 46.8% of them had hypertension Fig. 3.

#### 3.3. Intraoperative factors

In this study there was elective surgery preponderance and the majority of patients had general surgery 156(38%) followed by obstetric 142(34.5%) and urologic surgery 53(12.9%) respectively. Besides this 56.4% of patients took regional anesthesia and only 10.5% of patients had  $\geq 2$  h of surgical duration (as shown in Table 2) (see Table 3).

In patients who only took spinal anesthesia during intraoperative time only 24(10.3%) were noticed parasthesia during spinal needle insertion and 112(48.3%) had intraoperative shivering (Fig. 4).

**Table 1**

Socio-demographic characteristics of surgical inpatients who have undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N=411).

Characteristics	Category	Frequency(N)	Percentage (%)
Gender	Male	157	38.2
	Female	254	61.8
Age	18–24	72	17.5
	25–44	241	58.6
	45–64	55	13.4
	>64	43	10.5
Marital status	Single	69	16.8
	Married	283	68.9
	Divorced	33	8.0
	Widowed	26	6.3
Educational level	Up to elementary	179	43.9
	Secondary	160	38.9
	College & above	72	17.5

#### 3.4. Postoperative factors

Among study participants only 3.4% had postoperative vomiting and 31.1% had postoperative pain Fig. 5.

In patient who had spinal anesthesia; postoperatively only 19(8.2%) of them developed postoperative back pain and 32(13.8%) had postoperative headache.

#### 3.5. Satisfaction

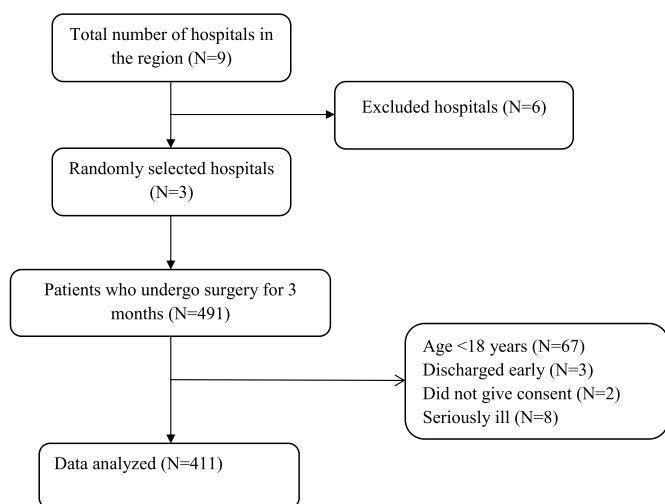
The overall satisfaction rate of this study was 64%, patients who score  $\geq 72$  is categorized under satisfied by using the demarcation threshold formula. From which 155(58.9%) were ASAII, 21(8%) were ASA III and 87(33.1%) were ASA I patients, in addition to this 212 (80.6%) of them had no comorbid illness. But no significant difference was observed on both ASA status and history of comorbid illness on patient's satisfaction ( $X^2(2) = 0.213, P = 0.899$ ) ( $X^2(1) = 0.081, P = 0.776$ ) respectively. Besides this 252(95.8%) of patients who are satisfied following anesthesia service were preoperatively visited by anesthetist but 11(4.2%) of them did not get the chance of preoperative anesthetist visit with no significant difference between the two( $X^2 = 0.004, P = 0.950$ ); on top of that only 76(28.9%) of them had monthly income of  $\geq 5000$  Ethiopian birr however no significant difference on patient satisfaction.

In addition to this 98(37.3%) of them were from general, 89(33.8%) obstetric, 35(13.3%) urology, 24(9.1%) gynecology, 12(4.6%) orthopedic and 5(1.9%) other surgery types with no significant difference on patient satisfaction between them ( $X^2(5) = 0.898, P = 0.970$ ).

Patient satisfaction based on postoperative anesthesia related factors; 256(97.3%) of patients who were satisfied had no episode of postoperative vomiting and only 60(22.8%) of patients who were satisfied had postoperative shivering. But no significant difference was observed on both postoperative vomiting and postoperative shivering on patient's satisfaction ( $X^2 = 1.231, P = 0.267$ ), ( $X^2 = 0.077, P = 0.781$ ) respectively.

#### 3.6. Associated factors for patient satisfaction

Bivariate analysis showed that gender, age, residence, level of education, marital status, history of anesthesia exposure, urgency of surgery, premedication, type of anesthesia, duration of surgery and postoperative pain were significantly associated with patient satisfaction following anesthesia. However, in multivariate analysis; history of anesthesia exposure, premedication, type of anesthesia and postoperative pain were independent risk factors (Table 4).



**Fig. 1.** Number of patients eligible for the study, included in the study and analyzed.

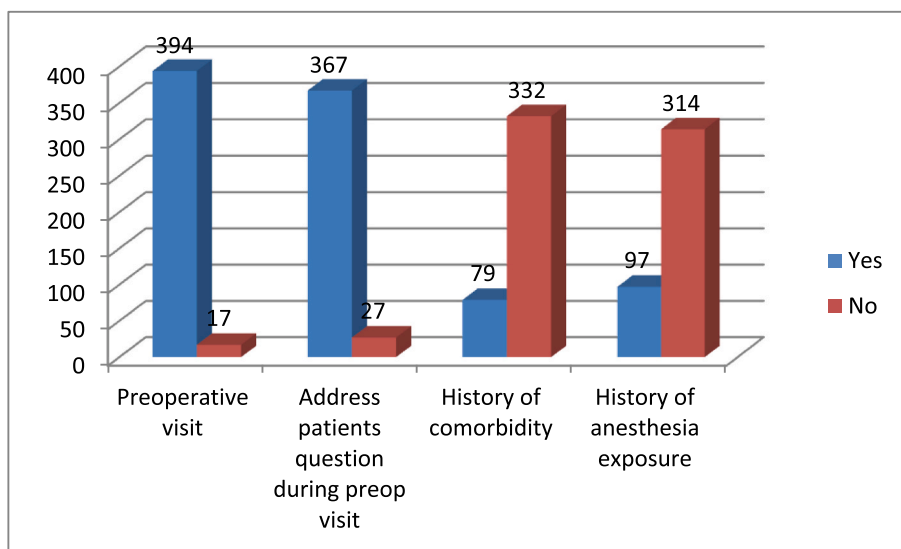


Fig. 2. Preoperative and anesthesia related factors of surgical inpatients who have undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N = 411).

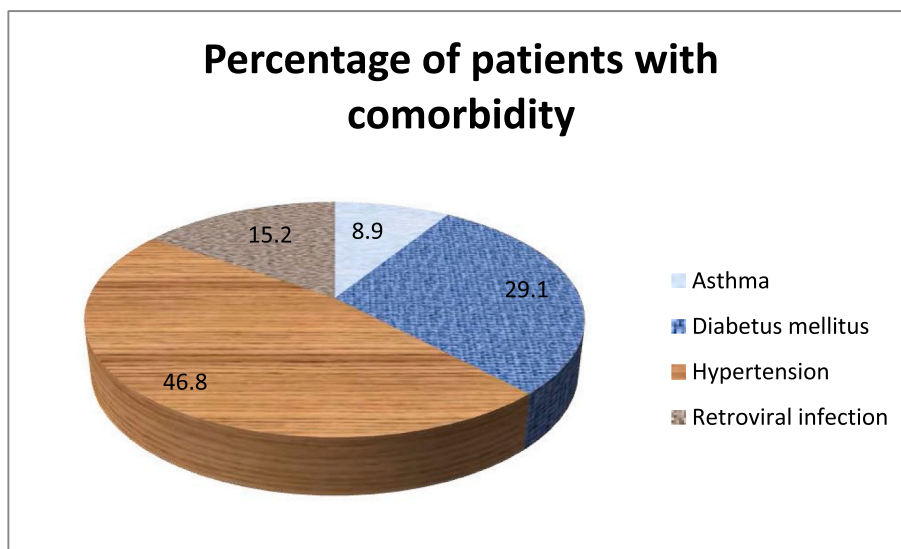


Fig. 3. Patients with comorbidity surgical inpatients who have undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N=79).

Table 2

Distribution of intraoperative factors of surgical inpatients who have undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N=411).

Characteristics	Category	Frequency(N)	Percentage (%)
Type of surgery	General surgery	156	38
	Obstetric surgery	142	34.5
	Gynecologic	36	8.8
	Orthopedic	17	4.1
	Urologic	53	12.9
	Other	7	1.7
Urgency of surgery	Emergency	165	40.1
	Elective	246	59.9
Type of anesthesia	General	186	45.3
	Regional	225	54.7
Duration of surgery	≤60 min	192	46.7
	60–120 min	176	42.8
	≥120 min	43	10.5
Premedication given	Yes	248	60.3
	No	163	39.7

#### 4. Discussion

Patient satisfaction is a relatively complex concept, mainly depends on the balance between patients' expectation and perceived quality of care and is determined by many factors like socioeconomic standard, demographic data, cultural level, patients' preferences, cognitive ability of the patients, past experiences and quality of assessment tool used [1, 2,4].

In the present study the overall patient satisfaction is 64%, similar to a study conducted in Eretria(68.8%) [1], the possible reason might be similar assessment tool and nearly similar socio demographic characteristics. In addition studies conducted in Ethiopia reported the overall patient satisfaction of 60% and 65% [10,22] in Hawassa and Gondar respectively, which are also in line with the present study.

In contrast to this study a recent study reported a low level of patient satisfaction (56.5%) [2], the possible reason might be they grouped "satisfied "and "dissatisfied" however in this study five point Likert scale was used and most importantly method of analysis(linear vs binary logistic regression).

**Table 3**

Distribution of variables and satisfaction of surgical inpatients who have undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N=411).

Characteristics	Category	Satisfied	Not satisfied	Total
Gender	Male	107	50	157
	Female	156	98	254
Age	18–24	39	33	72
	25–44	163	78	241
	45–64	37	18	55
	≥64	24	19	43
Level of education	Up to elementary	124	55	179
	Secondary school	96	64	160
	Higher education	43	29	72
Residence	Urban	158	99	257
	Rural	105	49	154
Marital status	Single	42	27	69
	Married	190	93	283
	Divorced	17	16	33
	Widowed	14	12	26
Urgency of surgery	Elective	150	96	246
	Emergency	113	52	165
History of anesthesia exposure	Yes	79	18	97
	No	184	130	314
Type of anesthesia	General	98	88	186
	Spinal	165	60	235
Duration of surgery	≤60 min	127	65	192
	60–120 min	126	60	176
	≥120 minutes	20	23	43
Premedication given	Yes	167	81	248
	No	96	67	163
Postoperative pain	Yes	58	70	128
	No	205	78	283

However, overall satisfaction in the present study is very low compared to other studies [6,8,9] the difference might be those studies were done on small sample size, only on preoperative assessment, difference in method of analysis and assessment tools.

A cross-sectional study reported that gender is an independent risk factor for patient satisfaction in which males were more satisfied [9], which is in line with this study. However, in the present study, it is not significant in multivariable logistic regression the possible reason for this might be the analysis method because they used chi-square test of

association instead of multivariable logistic regression that will reduce the chance of being significant when adjusted with other independent risk factors.

Studies reported that prevention of postoperative nausea/vomiting is a risk factor for perioperative patient satisfaction following anesthesia care (AOR (95% CI) P:2.575(1.163,5.698)0.02<sup>6,8-10</sup> in line with the present study because antiemetic premedication like dexamethasone, metoclopramide or a combination of them as appropriate is common clinical practice in study hospitals. Patients on anti-emetic premedication are 2.2 times more satisfied than those without antiemetic premedications AOR (95% CI) P value; 2.213(1.277–3.835) 0.005.

The present study found that history of anesthesia exposure is 2.3 times more satisfied than those who did not have AOR (95% CI) P value 2.311(1.244–4.294)0.008. The reason might be 92.8%(90/97) of patients who had history of anesthesia exposure in this study were exposed to spinal anesthesia, most of them for cesarean delivery that may reduce tension and stress for the upcoming surgery secondary to the provision of adequate analgesia and ability to stay awake so that they can hear crying newborn and watch their baby born even feed them in the immediate postoperative period that may increase their satisfaction. This is in line with a study done by B.C Demilew et al. [23] (who were reported that parturients with a history of anesthesia exposure were 3.94 times more satisfied than non-exposed).

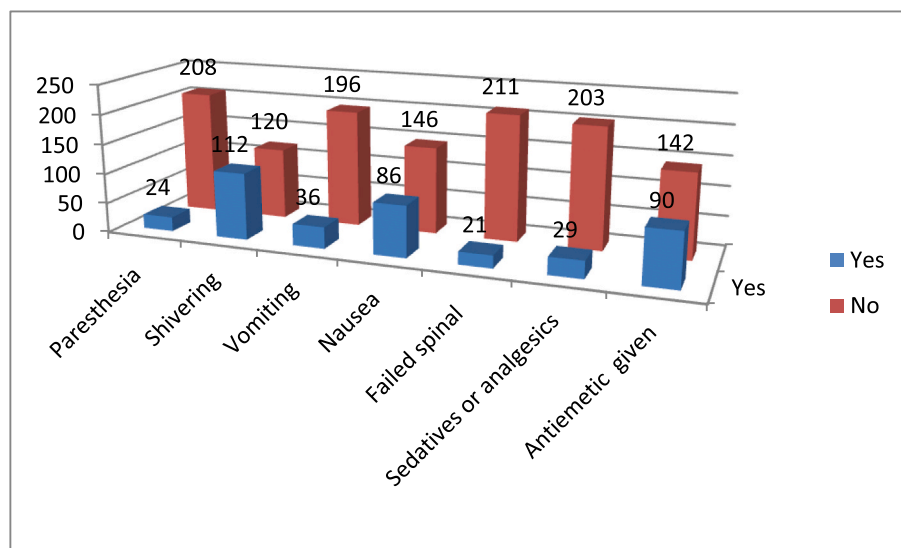
In this study patients operated under spinal anesthesia are 2.7 times (2.707(1.458–5.029) 0.002) more satisfied than those who were operated under general anesthesia, the reason might be inadequate analgesia in general anesthesia secondary to less to non-availability of strong opioids and peripheral nerve blocks in the form of multimodal analgesia, which is supported with a study done in Gondar, North West Ethiopia [9].

In this study moderate and severe postoperative pain is 2.4 times (1.452–4.065) <0.001 more dissatisfied which is in accordance with previous studies [2,8,10].

Limitations of the study: data were collected before the participants were discharged that might possibly restrain from speaking their mind because of dependence of care. Relatively small sample size and absence of surgical and anesthesia specifications.

### 5. Conclusion and recommendation

In general the overall patient satisfaction towards perioperative anesthesia service was low as compared with Leiden Perioperative care



**Fig. 4.** Distribution of intraoperative factors of surgical inpatients who have undergone surgery under spinal anesthesia in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N=232).

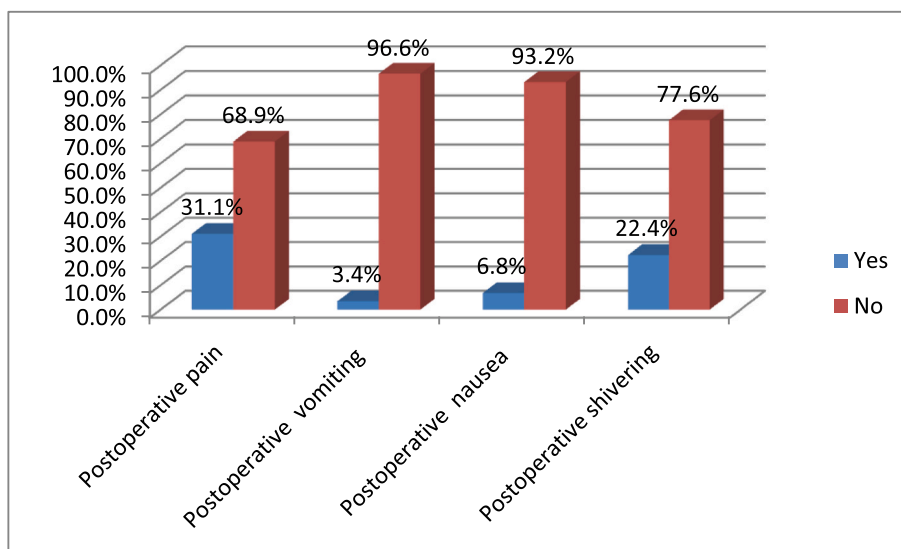


Fig. 5. Distribution of postoperative factors of surgical inpatients who undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N=411).

Table 4

Multivariable logistic regression of factors associated with satisfaction of surgical inpatients who have undergone surgery in three selected general hospitals, North Shewa, Amhara, Ethiopia, 2021 (N = 411).

Variables	Category	Frequency(N)	Percentage (%)	Satisfied	Not satisfied	Crude odd ratio	Adjusted odd ratio	95% CI	P value
History of Anesthesia exposure	Yes	97	23.6	79	18	3.101	2.311	1.244–4.294	0.008***
	No	314	76.4	184	130	1.000	1.000		
Premedication	Yes	248	64.5	167	81	1.439	2.213	1.277–3.835	0.005***
	No	163	60.3	96	67	1.000	1.000		
Type of anesthesia	Spinal	225	54.7	165	60	2.469	2.707	1.458–5.029	0.002***
	General	186	39.7	98	88	1.000	1.000		
Postoperative pain	Yes	128	31.1	58	70	1.000	1.000	1.452–4.065	<0.001***
	No	283	68.9	205	78	3.173	2.430		

\*Significantly associated at P < 0.05, 1.00: reference, \*significant, \*\*strongly significant and \*\*\*very strongly significant.

Patient Satisfaction and many previous studies. Factors that cause dissatisfaction should be prevented or better treated and every stake holder should be trained and participated.

We recommend routine premedication for all surgical patients and provision of adequate pain management especially for patients who are operated under general anesthesia. Nonetheless, it is essential to carry out further studies with surgical and anesthesia specification.

**Ethical approval**

Ethical approval was obtained from Debre Berhan University ethical review board.

**Funding**

The authors received no financial support for the research authorship/or publication of this article.

**Authors’ contributions**

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article.

**Consent**

Oral informed consent was obtained from each participants before filling questioners.

**Registration of research studies**

Name of the registry: **Research studies**  
 Unique Identifying number or registration ID: 7502.  
 Hyperlink to your specific registration (must be publicly accessible and will be checked): [researchregistry7502](#)”.

**Guarantor**

Mr. Melaku Bantie Fetene(MSc) and Mr. Samuel Debas Bayable (MSc).

**Provenance and peer review**

Editor and reviewers comments were well addressed with all authors and responses to comments were incorporated in the manuscript before sending the revised form for publication.

Not commissioned, externally peer reviewer.  
 Yewlsew Fentie (MSc in Advanced Clinical Anesthesia) [fyewlsew@gmail.com](mailto:fyewlsew@gmail.com) helps us to check the overall writings.

## Declaration of competing interest

The authors declare that there is no conflict of interest.

## Acknowledgment

We would like to thank Debre Berhan University for giving us the chance to carry out this project. We also acknowledge the data collectors and staff of the department of anesthesia for their help and encouragement in conducting this project. We also heartfully thank all three hospitals for allowing us to do this project.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.103478>.

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