

Assessment of Patient's Knowledge and Attitudes toward Anesthesia Services at Referral Hospitals in South Eastern, Ethiopia

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Abstract

Background: Anesthesia, a word that millions of tongues speak daily around the globe, was first used by Greek philosopher dioscorides in the first century. However, modern anesthesia was not discovered until the mid-nineteenth century. Although this specialty has grown beyond operation room theater and the role of anesthesia services in the health care system has dramatically increased, poor public knowledge and image have been a long-standing and ubiquitous problem.

Objective: The objective of this study is to determine patient's knowledge and attitude toward anesthesia services and associated factors at referral hospitals in South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C

Methodology: An institutional-based cross-sectional study was conducted over four months on 369 adult surgical elective patients. A systematic random sampling technique was employed to approach the study participants. A structured questionnaire was used to interview the patients one day before the surgery on various questions. Univariate analysis, logistic regression model, and odds ratio were employed for analysis.

Result: The result of this study indicates that among a total of 369 patients, 57.18% of them have poor knowledge and attitude toward anesthesia services. Shockingly, more than half of the total respondents (56.6%) believed that surgeons are responsible for administering anesthesia to surgical patients and only 36.9% of them know ways of anesthetic administration. The output of logistic regression revealed that the following factors were found to be statically associated with poor knowledge and attitude; rural residence (OR, 7.014 (4.049-12.152), agriculture (OR, 5.084 (2.804-9.218), and housewife occupation (OR, 7.579 (2.769-20.745), patients with income of less than 1000 birr

(OR, 5.867 (1.485-23.175), patients with no anesthetic exposure (OR 3.242 (1.596-6.585)) and non-general proposed type of surgery (OR, 0.244 (0.132-0.449) with 95% CI.

Conclusion: This study result showed a large number of our patients have poor knowledge and attitudes toward anesthesia services, which are worthy of the attention of anesthetists and all health care providers involved in the care of surgical patients.

Keywords: Knowledge; Attitudes; Anesthesia services; Arsi university asella referral; Teaching hospital

Introduction

Anesthesia (From Greek "without sensation"), a word that millions of tongues speak daily around the globe, was first used by Greek philosopher dioscorides in the first century AD to describe the narcotic like effects of the plant mandragora. It is a state of a controlled, reversible loss of sensation or awareness that is induced for medical purposes. It may include some or all of the analgesia (relief or prevention of pain), paralysis (muscle relaxation), amnesia (loss of memory), and unconsciousness. It enables the painless performance of surgical procedures that would otherwise cause severe pain to the patient or would be technically unfeasible [1,2].

Modern anesthesia was not discovered until the mid-nineteenth century, in which the specialty of anesthesia began after its first successful public demonstration in 1846 and became firmly established in the following century. Following its first public demonstration, anesthesia has become one of the most advanced specialties in modern health care, particularly in the last several decades [3–5]. However, the roles of anesthesia services in the health care system particularly the anesthetist's role have long been suffering from low appraisal and poor

recognition among patients and general population [6–9]. A 2009 worldwide meta-analysis showed that less than two-thirds of patients knew that anesthetists are physicians [10].

Nowadays, anesthetists are responsible for the well-being of patients undergoing complex and invasive surgical procedures. Anesthetists play a very crucial role in a patient's medical care and in regulating critical life functions that range from perioperative patient management to critical and palliative care. However, very few patients know these roles and responsibilities. A recent study in India found that most of the patients (44.5 %) knew that operating surgeons were anesthesia providers, while only 22% of patients correctly knew anesthesia providers as anesthetists.

Anesthetist's duty also extended to outside the operating room, with a leading role in the management of trauma resuscitation, providing labor analgesia, and pain management. They are involved in running the intensive care unit and are an integral part of the resuscitation team in most hospitals. Surprisingly, a 2013 study found that only 22% of the patients knew correctly that an anesthetist is a person who will resuscitate the patients if any mishap occurs in ORT. It was observed that 63% of the cases felt that the role of the anesthetist in the operation theater is to put the patient to sleep [11].

Poor knowledge about anesthesia services is not limited to the public and patients. One study showed that even other healthcare personnel and academic staff do not know the current depth of anesthetic practice and the teaching potential of anesthetists [12]. A 2011 study in Israel conducted on paramedical staff found very shocking results; only 49.20% of respondents knew anesthesia was a different specialty and only 5.8% knew about regional anesthesia [13].

Most works of the literature showed that the possible reasons for limited knowledge and negative attitudes about anesthesia services were due to lower educational level, lack of previous pre-anesthetic teaching and health information, and the city where a person lives *i.e.*, rural [14]. Previous exposure to anesthesia and surgery also affects knowledge about anesthesia. One study showed that out of 103 patients who had previous exposure to anesthesia, 64 patients answered correctly about different types of anesthesia techniques while 81 patients, who had no previous exposure to anesthesia, answered incorrectly [15].

Generally, with the changing healthcare environment and advancements in anesthesia, the patients and public need to be educated and involved. It is important to determine and promote patients' knowledge and attitudes toward anesthesia services that would be beneficial to both patients and service providers.

Materials and Methods

Multi-center based cross-sectional study was conducted at three South-Eastern referral hospitals of Ethiopia; Arsi University Asella Referral and Teaching Hospital (AUARTH), Shashemene Referral Hospital, and Adama Referral Hospital and Medical

College from December 1, 2020, to April 1, 2021, G.C. The Source population consisted of all adult patients who were admitted to undergo surgery in referral hospitals of South-Eastern Ethiopia. The study population included all surgical elective patients who were admitted and scheduled for elective surgery in referral hospitals of South Eastern Ethiopia during the study period. Inclusion criteria were; patients who were posted for elective surgery and patients with an age of more than 18 years were included. Conversely, uncooperative patients, unable to speak, with severe medical or surgical conditions (ASA Grade 3 and above), and patients who underwent emergency surgery were excluded. The formula for calculating sample size (estimation of population proportion) is:

$$n = \frac{(Z\alpha/2)^2 \times p(1-p)}{d^2} = \frac{(1.96)^2 \times 0.682(1-0.682)}{0.05^2} = 334$$

Where: n=Sample size=334, C.I=95%, a=0.05, D=Precision=0.05, P=68.2% (patients who have poor knowledge and attitudes toward anesthesia services, taken from the previous study at Tikur Anbessa specialized hospital, Ethiopia [16]. Non-respondent rate (10%)=35. Therefore, the total sample size=369.

A systematic random sampling technique was employed to approach the study participants. The sampling interval (K^{th}) was calculated using population size and total sample size. Population size (N) is taken from the average number of adult elective operations performed as of the surgical registration book for the last five years, and the total sample size (n) is calculated using population proportion. Therefore, sampling fraction or interval (K^{th})= $N/n=738/369=2$. Accordingly, every other patient posted for pre-operative evaluation and scheduled for elective surgery was selected to participate in the study until the required sample size was achieved.

The study was conducted by interviewing patients using a structured questionnaire, which was prepared in English and then translated into Amharic and Afan Oromo. The checklist was also used to obtain the patient's information from the chart. Two data collectors were selected and 5 days of training were given on how to complete data and supervised by the investigators during data collection. Patients were asked by data collectors to self-report on socio demographic characteristics and other independent factors. They were also asked to respond to their opinion for questions to assess knowledge and attitudes. On the other hand, the proposed type of surgery was obtained from the patient's chart and pre-operative schedule format.

Knowledge is a patient's state of knowing, familiarity, and understanding of anesthesia services. In this study, the patient will be considered as having good knowledge, if he/she answers correctly more than half of the 12 knowledge questions provided (≥ 6). Attitude is a set of feelings, beliefs, characteristics, and behaviors of patients toward anesthesia services. Similarly, as for knowledge, the patient will be considered as having a good attitude, if she/he answers correctly more than half of the 12 attitude questions provided (≥ 6). Generally, a patient will be considered as having good

knowledge and attitude if she/he answered more than half of the knowledge and attitude questions provided (≥ 12).

During data collection, regular supervision and follow-up were made by the researchers and cross-checked for completeness and consistency of collected data daily. Once the data was collected and checked for completeness, consistency, and accuracy, it was sorted and categorized. Then, the data were entered into the computer using a developed data entry format, coded for each category of variables, and cross-checked for errors. Univariate analyses such as frequency and percentage were computed for variables such as age, gender, type of surgery, education level, occupation, previous history of anesthesia or surgery, and knowledge and attitude related questions. A logistic regression model and odds ratio was used

to measure the association of independent and dependent variables. A p-value of less than 0.05 was considered to constitute a statistically significant difference.

Results

Description of sociodemographic characteristics

Out of a total of 369 participants included in the analysis, 52.3% were male and 47.7% were female. Most of the patients (22.8%) were aged between 46 and 55 years. Consequently, patients who came from rural areas and were illiterate accounted for 75.6% and 43.9%, respectively. Most of the participants (65.3%) run their life by agriculture (Table 1).

Table 1: Description of sociodemographic and patient factors among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Variables		Frequency	Percentage
Sex	Male	193	52.3
	Female	176	47.7
Age	18-25	24	6.5
	26-35	83	22.5
	36-45	71	19.2
	46-55	84	22.8
	56-65	54	14.6
	66-75	51	13.8
Residence	Urban	90	24.4
	Rural	279	75.6
	Agriculture	241	65.3
	Housewife	28	7.6
Occupation	Student	13	3.5
	Self-employed	20	5.4
	Government employed	67	18.2
	Illiterate	162	43.9
	Manage to write and read	80	21.7
Academic level	Primary school level	12	3.3
	Secondary school level	74	20.1
	College/university graduate	41	11.1
	<1000	19	5.1
Income	1000-2000	150	40.7
	>2000	158	42.8
	No income	42	11.4
Anesthetic exposure	Yes	84	22.8
	No	285	77.2
Type of anesthesia	General anesthesia	36	9.8
	Regional anesthesia	64	17.3

Type of planned surgery	General surgery	184	49.9
	Orthopedic surgery	70	19
	Gynecologic surgery	103	27.9
	Urologic surgery	12	3.3

Knowledge of anesthesia provision: In the knowledge assessment, out of 369 respondents, most of the patients (74.5%) believed that anesthesia is necessary for surgery. When asked about ways of anesthetic administration, 15.7% of them did not know how it is provided. Only 36.9% of them know ways of anesthetic administration. In the assessment of the type of

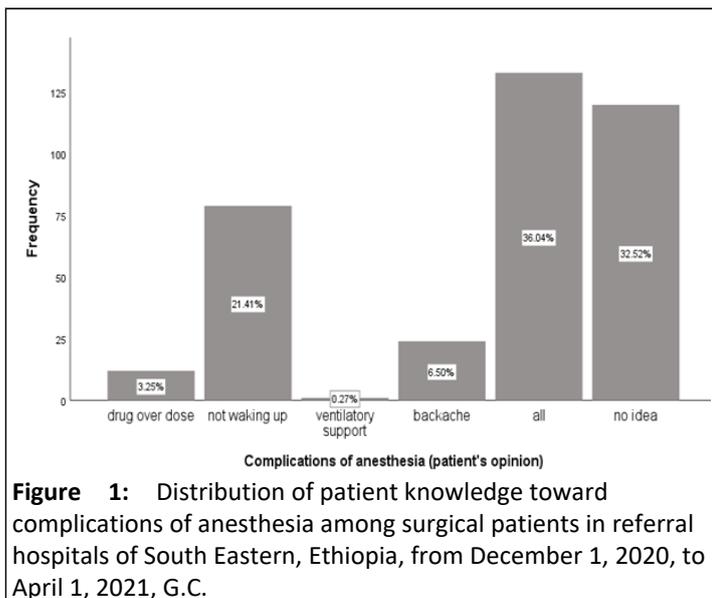
foods allowed two hours before surgery, most patients (43.4%) think nothing should be eaten. Only 127 (34.4%) of them were known as liquid foods. One hundred thirty-three of the respondents knew what anesthesia is about, and 34.1% of them have no idea about anesthesia (Table 2).

Table 2: Description of patient's knowledge toward anesthesia provision among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Variables		Frequency	Percentage
Necessity of anesthesia for surgery	Yes	275	74.5
	No	84	22.8
	I don't know	10	2.7
Patient's opinion about anesthesia	Making area insensitive	87	23.6
	Putting to sleep	23	6.2
	Both	133	36
	No idea	126	34.1
Anesthetic agent during surgery	Inhaled gas	21	5.7
	IV drug	98	26.6
	Inhaled and IV	136	36.9
	Oral pills	44	11.9
	IM injection	12	3.3
	I don't know	58	15.7
Type of food allowed 2 hr before surgery	Liquid foods	127	34.4
	Solid foods	11	21.4
	Soft drinks	10	2.7
	I don't know	61	16.5
	None	160	43.4
Risk of anesthesia for patients with diabetes, hypertension, and smoker	Yes	271	73.4
	No	67	18.2
	I don't know	31	8.4

In the assessment of patients' knowledge of complications of anesthesia, 36.04% of them know complications of anesthesia

and 32.52% have no idea about complications of anesthesia (Figure 1).



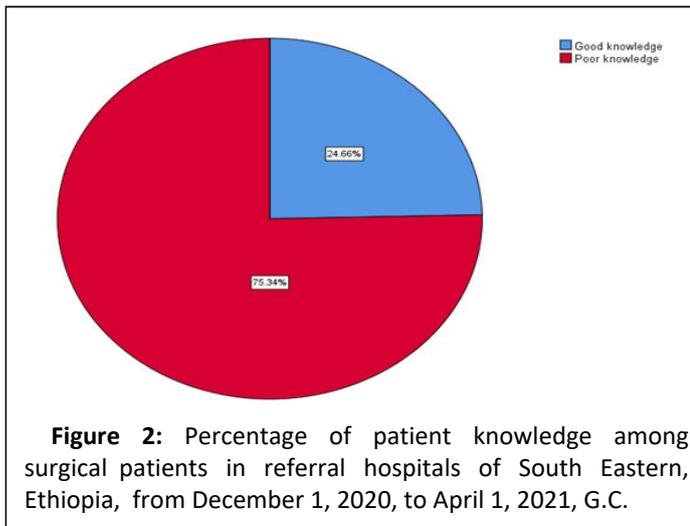
Knowledge toward anesthetists: In patients' knowledge assessment of anesthetists, shockingly, more than half of the total respondents (56.6%) believed that surgeons are responsible for administering anesthesia to surgical patients. Only 124 (33.65) known anesthetists will provide anesthesia for surgery. Similarly, the majority of the patients (60.2%) knew the surgeon decides if a patient is fit for anesthesia or not and 55% of them think surgeons will determine if a patient can eat before surgery. Regarding the role of making sure patients recover after anesthesia, in the same way, most of the patients (43.6%) think it's the role of surgeons while only 18.43% of them knew anesthetists estimate and transfuse blood in the operation theater. On the other hand, most patients (59.6%) know the anesthetist's responsibility (anesthetizing and taking care of the patient's vital signs) in the operation theater (Table 3).

Table 3: Description of knowledge of patients toward anesthetists among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Variables		Frequency	Percentage
Who will administer anesthesia	Surgeons	209	56.6
	Nurses	24	6.5
	Anesthetists	124	33.6
	I don't know	12	3.3
Who will determine the fitness of the patients for surgery	Surgeons	222	60.2
	Nurses	12	3.3
	Anesthetists	123	33.3
	I don't know	12	3.3
Who will determine if a patient can eat before surgery	Surgeons	203	55
	Nurses	49	13.3
	Anesthetists	96	26
	I don't know	21	5.7
Role of the anesthetist in the operation room	Only anesthetizing the patient	59	16
	Anesthetizing and takes care of patient's vital signs	220	59.6
	I don't know	90	24.4
Who makes sure the patient recovers smoothly?	Surgeons	161	43.6
	Anesthetists	95	25.7
	Nurses	90	24.4
	I don't know	23	6.2
Who estimates and transfuses blood	Anesthetists	68	18.4
	Nurses	36	9.8
	I don't know	22	6

Generally, in this study among 369 patients, only 24.66% have a good knowledge and the remaining 75.34% have poor

knowledge of anesthesia services (Figure 2).



Patient's attitude

Assessment of the patient's attitude was addressed as agree, disagree, or neither of the two for the questions provided. Out of 369 respondents, the majority of patients (88.1%) agreed positively about meeting the anesthetist before an operation and 71% of them prefer the less they know about anesthesia the better it would be. Similarly, most of the respondents (79.7%) agreed that anesthetists should tell them all the complications no matter what. One hundred seventy-six (47.7%) patients were not afraid, more about the anesthetic than the surgery. Regarding information on anesthesia services, 58.5% of them preferred anesthetists to explain to them than read about it. One hundred twenty-four (70.3%) patients do not care about the anesthetic, so long as it is a smooth operation. The most feared risk of anesthesia is feeling pain (39.30%) (Table 4).

Table 4: Description of patient's attitude toward anesthesia services among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Patient's attitude toward anesthesia services		Frequency	Percentage
Meeting the anesthetist before the operation	Agree	325	88.1
	Disagree	21	5.7
	Neither of two	23	6.2
Fewer patients know about the anesthetic, the better	Agree	262	71
	Disagree	84	22.8
	Neither of two	23	6.2
All patients need to know about the operation is what surgeon tells them	Agree	276	74.8
	Disagree	93	25.2
More nervous about the anesthetic than the surgery itself	Agree	161	43.6
	Disagree	176	47.7
	Neither of two	32	8.7
Anesthetists do not take time to explain what is going to happen	Agree	216	58.5
	Disagree	144	39
	Neither of two	9	2.4
Patients prefer to read things than an anesthetist explain	Agree	326	88.3
	Disagree	43	11.7
Anesthetists should tell what all complications	Agree	294	79.7
	Disagree	68	18.4
	Neither of two	7	1.9
Patients would like to see the anesthetist after the operation	Agree	299	81
	Disagree	48	13
	Neither of two	22	6
Patients don't care about the anesthetic	Agree	124	33.6
	Disagree	212	57.5
	Neither of two	33	8.9

A good anesthetist is someone who sees me before and after the operation	Agree	337	91.3
	Disagree	23	6.2
	Neither of two	9	2.4
Anesthetists should be involved in preop. evaluation	Agree	331	89.7
	Disagree	8	2.2
	Neither of two	30	8.1
What makes patients afraid of the operation	Taking anesthetic	12	3.3
	Feeling pain	145	39.3
	Not waking up	66	17.9
	Nausea and vomiting	11	3
	Not afraid	89	24.1
	Other	46	12.5

Generally, in this study among 369 patients, only 82.66% have a positive attitude and the remaining 17.34% have a negative attitude toward anesthesia services (Figure 3).

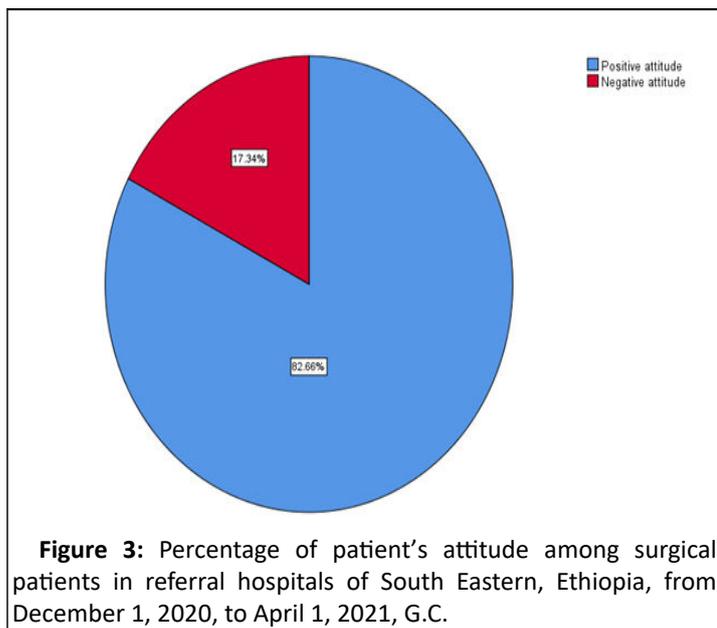


Figure 3: Percentage of patient's attitude among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Patient's knowledge and attitude

According to our findings, out of 369 patients, 57.18% of them have poor knowledge and attitude while 42.82% of them have good knowledge and attitude toward anesthesia services (Figure 4).

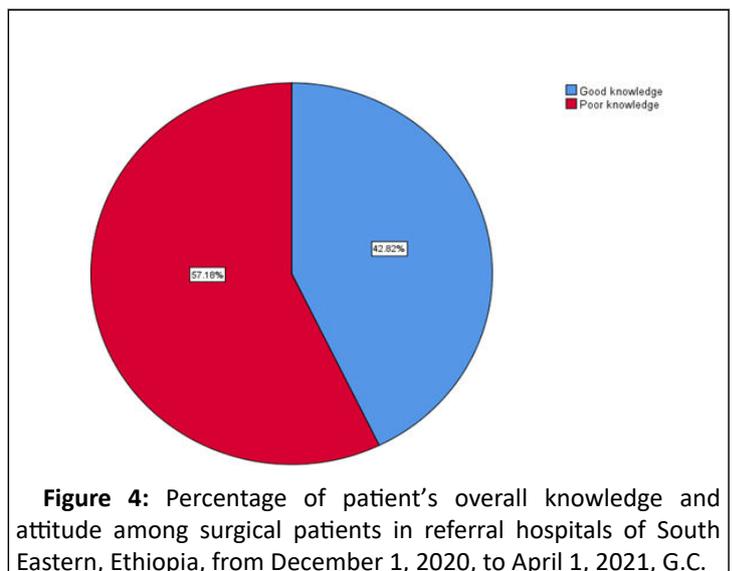


Figure 4: Percentage of patient's overall knowledge and attitude among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Associated factors of poor knowledge and attitude

The output of binary logistic regression analysis identifies the following sociodemographic and patient factors that are significantly associated with poor knowledge and attitude (with p-value <0.05); Rural residence 7.014 (4.049-12.152), agriculture occupation 5.084 (2.804-9.218), housewife occupation 7.579 (2.769-20.745), patients with income of less than 1000 birr 5.867 (1.485-23.175), patients with the previous history of anesthetic exposure 3.242 (1.596-6.585) and patients with non-general surgery proposed type of procedure 0.244 (0.132-0.449). On the other hand, sociodemographic and patient-related factors such as sex, age, and type of anesthesia are not significantly associated with poor knowledge and attitude (Table 5).

Variables		Knowledge and attitude status	OR (95% CI)	P-value	Poor (%)
Sex	Male	41 (21.2)	152 (78.8)	0.689 (0.455-1.044)	0.079
	Female	50 (28.4)	126 (71.6)	1	
Age category	18-25	10 (41.7)	14 (58.3)	1.400 (0.078-25.144)	0.819
	26-35	39 (47)	44 (53)	1.128 (0.068-18.648)	0.933
	36-45	24 (33.8)	47 (66.2)	1.958 (0.117-32.694)	0.64
	46-55	57 (67.9)	27 (32.1)	0.474 (0.029-7.863)	0.602
	56-65	14 (25.9)	40 (74.1)	2.857 (0.167-48.797)	0.468
	66-75	13 (25.5)	38 (74.5)	2.923 (0.170-50.153)	0.46
	>75	1 (50)	1 (50)	1	
Residence	Urban	69 (76.7)	21 (23.3)	1	
	Rural	89 (31.9)	190 (68.1)	7.014 (4.049-12.152)*	0
Occupation	Agriculture	80 (33.2)	161 (66.8)	5.084 (2.804-9.218)*	0
	Housewife	7 (25)	21 (75)	7.579 (2.769-20.745)*	0
	Student	4 (30.8)	9 (69.2)	5.684 (1.561-20.642)	0.078
	Self-employed	19 (95)	1 (5)	0.133 (0.017-1.064)	0.057
	Government employed	48 (71.6)	19 (28.4)	1	
Academic level	Illiterate	66 (40.7)	96 (59.3)	1	
	Write/read	9 (11.3)	71 (88.8)	5.424 (2.534-11.609)*	0
	Primary school	4 (33.3)	8 (66.7)	1.375 (0.398-4.754)*	0
	Second. school	42 (56.8)	32 (43.2)	0.524 (0.300-0.914)	0.023
	College/Univ.	37 (90.2)	4 (9.8)	0.074 (0.025-0.218)	0.615
Income	No income	22 (52.4)	20 (47.6)	5.867 (1.485-23.175)	0.012
	<1000 birr	3 (15.8)	16 (84.2)	3.242 (1.596-6.585)*	0.001
	1000-2000 birr	38 (25.3)	112 (74.7)	0.729 (0.368-1.448)	0.366
	>2000 birr	95 (60.1)	63 (39.9)	1	
Anesthetic exposure	Yes	54 (64.3)	30 (35.7)	1	
	No	104 (36.5)	181 (63.5)	3.133 (1.886-5.203)*	0
Type of anesthesia	GA	23 (63.9)	13 (36.1)	1.339 (0.563-3.183)	0.509
	RA	45 (70.3)	19 (29.7)	1	
Type of proposed surgery	General surgery	76 (41.3)	108 (58.7)	0.244 (0.132-0.449)*	0
	Orthopedic	52 (74.3)	18 (25.7)	1.712 (1.002-2.870)	0.051
	Gynecologic	30 (29.1)	73 (70.9)	1	

(1-Reference category, OR: Odds Ratio; CI: Confidence Interval; GA: General Anesthesia; RA: Regional Anesthesia; * -significantly associated variables at P value less than 0.05, Birr-Unit of currency in Ethiopia)

Table 5: Associated factors of poor knowledge and attitude toward anesthesia services among surgical patients in referral hospitals of South Eastern, Ethiopia, from December 1, 2020, to April 1, 2021, G.C.

Discussion

Knowledge and attitude toward anesthesia services

This study was designed to assess patient's knowledge and attitudes toward anesthesia services to ascertain the degree of patient satisfaction in this dramatically advancing anesthesia specialty. Regarding knowledge assessment, among 369 respondents, only 24.66% have good knowledge and the remaining 75.34% have poor knowledge of anesthesia services. Almost similar results were observed in a recent study in Saudi Arabia, where out of a total of 200 respondents, only 26% of participants were known about anesthesia services, and most of the patients were not aware of their roles [17]. This is in agreement with a 2009 worldwide meta-analysis that showed that less than two-thirds of patients knew anesthesia services. On the other hand, a 2016 study in India found a lower percentage of poor knowledge. Out of 180 participants, only 40% have poor knowledge of anesthesia services [18]. This might be because, in India, the patients have good information and knowledge about anesthesia services.

There is a widespread misconception of the role of anesthetists all over the world, and there is considerable confusion in the public mind about what the anesthetist does in the operation theater. In our study, a higher percentage (59.6%) of patients taught anesthetists intraoperatively monitor heart, blood pressure, and breathing. On the other hand, a study done in Hong Kong and Korea showed only 25% and 18.8% of patients, respectively, thought anesthetists have the responsibility for these vital sign monitoring [19]. For the responsibility of estimating and transfusing blood intraoperatively, 18.43% of patients responded to an anesthetist, which was a higher result when compared to a study done by the Korean Association of anesthesiologists.

Our study also showed that only 33.6% of them know that anesthetists are in charge of anesthesia during the surgery. This is lower when compared with the study in Addis Ababa where 42% of the patients knew, anesthesia was provided by the anesthetists. This might be due to the study conducted in Tibur Anbessa Specialized Hospital (TASH) which is at the very top of the referral system in our country and located in the capital city, Addis Ababa. It has provided a variety of informed patients from every corner of Ethiopia. However, this study showed a better result than a study done in Nigeria which was 19%.

In this study, only 33.3% of the patients believed that anesthetists are responsible for making sure that the patient is fit for anesthesia. Most of them (60.2%) believed it's the responsibility of surgeons. This may be because anesthetists are often busy in operating theaters with little and limited time to interact with their patients pre and post operatively.

Knowledge of the route of general anesthesia administration was correctly answered by 36.9% of the patients, which was very low. It is comparable with the study done in Pakistan. This might be due to these countries being categorized as the third world, which sets a high illiteracy rate. Regarding, the risk of anesthesia in high-risk patients like patients with hypertension and DM, 73.4% responded it has increased risk which was a higher finding than the study done in India (41%).

For the responsibility of making sure smooth recovery in post-op, 25.7% of our patients believed anesthetists are responsible while in the study done in Hong Kong it was 65%. The reason for this significant difference could be most of our patients are sedated intraoperatively therefore; they know less about the role of anesthetists during this period. In the case of Hong Kong, as they have an advanced setup, they could use modern anesthetic techniques such as ultrasound-guided regional anesthesia that will reduce the use of sedative agents. Regarding complications of anesthesia, 32.52% of our patients believed anesthesia has no complications. This is comparable with the study done in India, which found that 31% of patients thought it has no complication.

In the knowledge assessment of who will estimate and transfuse blood in the operation theater, shockingly; the majority of patients (65.85%) believed all responsibilities belong to surgeons. Out of 369 respondents, only 18.43% knew anesthetists to estimate and transfuse blood in the operation theater. This might be because in most Ethiopian hospitals physicians are working closely with the patients starting from OPD up to admission, preparation, diagnosis, and post-operative management which might have misled the patients.

Regarding attitude assessment, among 369 patients, 82.66% have a positive attitude and the remaining 17.34% have a negative attitude toward anesthesia services. This might show the positivity of our community toward any profession. Most of our patients would like to meet their anesthetist preoperatively (88.1%) which is a little bit higher than the study done in Hong Kong (77%) [19]. This might be due to, although our patients have poor knowledge, they have a positive attitude toward anesthesia services. On the contrary, in Hong Kong, a patient's better knowledge negatively affects their attitude. Seventy-one percent (71%) of our patients think that the less they know about the anesthetic the better, which is a similar result when compared to the study done in Hong Kong.

In this study, seventy-four percent of patients also agreed all they needed to know was what their surgeon tells them. This might be due to surgeons spending more time with the patients in the ward and clinic, patients may think the surgeon gives them all the information they need to know. Regarding the importance of the anesthetist's explanation, of what is going to happen to the patient, 58.5 % agreed and 39% disagreed. This

shows that most of the patients do not know how anesthetists work and do not expect an explanation from them.

Eighty-one percent of patients from this study would like to see their anesthetist postoperatively, and 33.6% of the patients do not care about the anesthesia as long as the operation went smoothly. However, the findings from Hong Kong revealed a different value, which was 42% and 13%, respectively. This result showed a large number of our patients do not care and are concerned about anesthesia services.

Generally, according to our findings, out of 369 patients, 57.18% of them have poor knowledge and attitude while 42.82% of them have good knowledge and attitude toward anesthesia services.

Associated factors of poor knowledge and attitude

The output of binary logistic regression analysis identifies the following sociodemographic and patient factors as a significant predictor of poor knowledge and attitude toward anesthesia services (with p -value < 0.05); rural residence with OR of 7.014 (4.049-12.152), agriculture occupation with OR of 5.084 (2.804-9.218), housewife occupation with OR of 7.579 (2.769-20.745), patients with income of less than 1000 birr with OR of 5.867 (1.485-23.175), patients with no previous history of anesthetic exposure with OR of 3.242 (1.596-6.585) and patients with non-general surgery proposed type of procedure with OR of 0.244 (0.132-0.449).

According to this study finding, patients who live in rural areas have poorer knowledge and attitude than patients who live in urban areas. Among patients who live in rural areas, 68.1% of them have poor knowledge and attitude, compared to 23.3% in urban areas. According to logistic regression output, the likelihood of poor knowledge and attitude in patients from rural areas was seven times more likely than in urban areas, with an OR of 7.014 (4.049-12.152). The same findings were observed in a study done in Saudi Arabia and Nigeria. In our country, it is known that people who live in urban areas are more likely to be educated than the people who live in rural areas according to the 2011 Ethiopia demographic and health survey. It is also known that more educated people tend to read and have better general knowledge than those who do not.

In this study, it was also found that patients who had no previous experience of anesthesia have poor knowledge and attitude compared to those who had exposure. Among patients who had no previous anesthesia exposure, 63.5% of them had poor knowledge and attitude, compared to 35.7% of patients with no exposure. According to logistic regression output, patients who had no previous experience with anesthesia have poor knowledge and attitude three times more likely compared to those who had exposure with OR of 3.242 (1.596-6.585). Similarly, a 2018 study in Nepal found, a statistically significant correlation between past exposure to anesthesia and knowledge about anesthesia. A 2011 study by de Oliveira, et al. also established a significant positive correlation between prior anesthetic experience and patients' knowledge of anesthesia service. This might be due to those patients being well-informed

by anesthetists during their previous exposure to anesthesia and surgery.

Patients with agriculture and housewife occupation have poor knowledge and attitude compared to government employees. According to logistic regression output, patients with agriculture occupations have poor knowledge and attitudes five times with OR of 5.084 (2.804-9.218) and patients with housewife occupations eight times with OR of 7.579 (2.769-20.745) more likely than government employed, respectively. According to logistic regression, it was also found that patients with an income of less than 1000 birr have poor knowledge and attitude compared with patients with >2000 -birr income. They were six times more likely to have poor knowledge and attitude, with an OR of 5.867 (1.485-23.175). This is similar to a study in Addis Ababa, where higher income correlated well with knowledge of anesthesia services. Other sociodemographic and patient-related factors such as sex, age category, type of anesthesia was not statistically significant with poor knowledge and attitude (with a p -value greater than 0.05).

Conclusion

This study result showed a large number of our patients have poor knowledge and attitudes toward anesthesia services, which are worthy of the attention of anesthetists and all health care providers involved in the care of surgical patients. Anesthetists and stakeholders should have to work hand in hand and improve Ethiopian patient's health information regarding anesthesia services and bring about a positive attitude towards the profession.

Declarations

Ethical approval and consent to participate: Not applicable

Consent for publication: Not applicable

Availability of data and materials: Data will be available based on reasonable requests of corresponding authors.

Competing interests: We declared that we had no competing interests.

Author's contribution: DC.E and MS. O were involved in the conception, study design, execution, acquisition of data, analysis, and interpretation of data, took part in drafting the article or revising it critically for important intellectual content. AH.G, MA.G, BT.G, EN.T, NG.W, AB.W, and KM.A were involved in study design, execution, acquisition of data, analysis, interpretation, drafted, and final manuscript writing. All authors reviewed and agreed on all versions of the manuscript before submission, agreed to submit to the current journal; gave final approval of the version to be published; and agreed to be accountable for all aspects of the work.

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