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Preoperative patients' knowledge level regarding anesthesia procedures and anesthesiologist responsibilities

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ABSTRACT

Aims: Anesthesiology plays a pivotal role in modern surgical interventions, yet there remains a lack of public awareness regarding the duties of anesthesiologists. This study aimed to evaluate the knowledge level of preoperative patients regarding anesthesia procedures and anesthesiologists' responsibilities, alongside assessing patient satisfaction with anesthesia polyclinic services.

Methods: A descriptive study was conducted at Marmara University Pendik Training and Research Hospital's Anesthesia Outpatient Clinic. A total of 164 preoperative patients were surveyed using a questionnaire comprising socio-demographic questions, health status inquiries, knowledge assessment regarding anesthesia, and satisfaction evaluation of anesthesia polyclinic services.

Results: Results showed inadequate knowledge levels among participants regarding anesthesiologists' duties, despite high satisfaction scores. Educational status correlated positively with knowledge levels, with university-educated individuals exhibiting better understanding. However, no significant differences in demographic characteristics were found between groups with low and high knowledge levels. Moreover, a weak positive correlation was observed between knowledge level and patient satisfaction.

Conclusion: The findings underscore the importance of providing comprehensive information during preoperative assessment to enhance patient awareness and satisfaction. Organizational adjustments in anesthesia clinics and media involvement are suggested to raise public awareness about anesthesiologists' roles. This study highlights the need for tailored patient education strategies to bridge the knowledge gap and optimize perioperative care outcomes.

Keywords: Anesthetist, education, polyclinic, preparation, satisfaction, surgery

INTRODUCTION

Anesthesiology and reanimation, officially recognized as a separate specialty in Turkiye since 1956, has been increasingly contributing to surgical successes with the integration of technological advancements into the field of medicine.[1,2] Anesthesia specialists not only work in operating rooms but also in preoperative evaluation clinics, pain management clinics, outpatient sedation units, and intensive care units. However, it cannot be said that the public is well-informed about this, as supported by both national and international studies.[3,4] This is a significant issue because initiatives to increase health literacy affect patient outcomes.[5-7] Patients scheduled for surgery experience significant anxiety, which negatively impacts surgical outcomes. Studies have shown an inverse relationship between knowledge levels and anxiety levels, indicating that efforts should be made to increase knowledge levels.[8-10]

The aim of our study was to assess the level of knowledge about anesthesia procedures and the duties of an anesthetist among patients undergoing surgery at a university hospital, as well as to measure patient satisfaction with outpatient clinic services.

METHODS

Our study is descriptive for which ethical approval was obtained from Marmara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 06.01.2023, Decision No: 09.2023.97). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Preoperative patients aged between 18-65 years who applied to the Anesthesia Outpatient Clinic of Marmara University Pendik Training and Research Hospital and had no communication barriers constituted the population of the study. Accordingly, after providing necessary information about the research to the patients through face-to-face interviews and obtaining voluntary consent forms, the required data were collected. The data collection process was conducted between February-May 2023. The collected data were transferred to Microsoft Excel program. Permission was also obtained from the Chief Physician of the hospital.

During the data collection process, a specific scale was not used. The survey questions were developed by the researchers based on a literature review. The survey consists of 30 questions (Appendix) to measure patients' health status, knowledge level about anesthesia, and satisfaction level with the services provided at the anesthesia outpatient clinic. Three socio-demographic questions, three questions related to health status, 17 questions to measure the knowledge level about anesthesia in true-false and multiple-choice formats, and seven questions in five-point Likert scale format to measure satisfaction level were asked. For the section of the survey aimed at measuring patients' knowledge about anesthesia procedures and the anesthesiologist's duties, each correct answer in the 17-item section was scored as 1, while each incorrect answer was scored as 0. In the section of the survey measuring satisfaction with outpatient clinic services, which included seven questions in a 5-point Likert scale format, each response was calculated to receive a score ranging from 1 to 5. Consequently, the highest possible score that could be obtained from this section of the survey was 35.[11]

Jamovi 2.3 software (www.jamovi.org) was used for data analysis. First, a normality test was conducted for data evaluation. Since the data did not show normal distribution, t-tests could not be performed. Mann-Whitney U test was used for the analysis of two independent variables, and ANOVA test for the analysis of more than two independent variables with Tukey post-hoc test for pairwise group comparisons. Spearman test was used for correlation analysis. The statistical significance level was accepted as $p<0.05$. No power analysis was conducted for the study.

RESULTS

A total of 430 patients were selected for our study. Among these patients, 175 agreed to participate. Due to inadequate communication with 11 patients, the survey could not be completed, resulting in a final sample size of 164 patients. The flow chart of the study is presented in Figure 1. Of the analyzed patients, 110 were female (67.1%), and the median age was 45 years. The demographic and clinical characteristics of the patients are presented in Table 1.

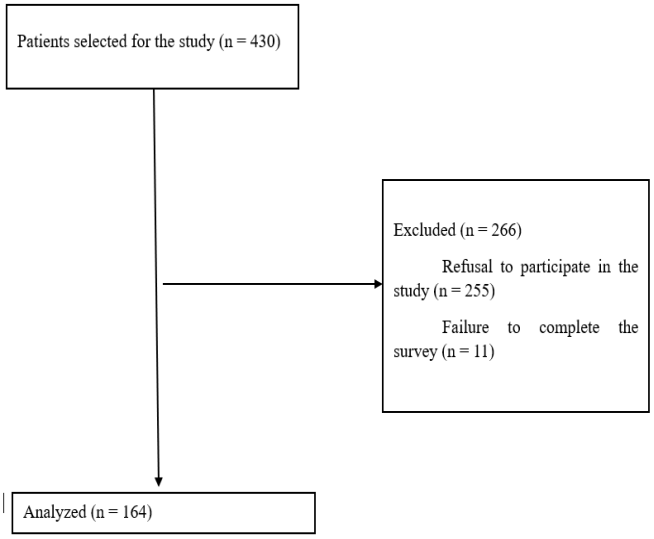

Figure 1. Study flow diagram

Table 1. Demographic and clinical characteristics of preoperative patients

Age (year)	45 (35-54)
18-34	39 (23.8)
35-49	60 (36.6)
50-65	65 (39.6)
Gender	
Male	54 (32.9)
Female	110 (67.1)
Education status	
No	5 (3.0)
Primary school	53 (32.3)
Middle school	19 (11.6)
High school	38 (23.2)
University	44 (26.8)
Above university	5 (3.0)
Number of chronic diseases	
0	89 (54.3)
1	40 (24.4)
2	17 (10.4)
3	10 (6.1)
≥4	8 (4.8)
Number of medications used	
0	81 (49.4)
1	37 (22.6)
2	18 (11.0)
3	10 (6.1)
≥4	18 (10.9)
Previous surgery	
Yes	111 (67.7)
No	53 (32.3)

Note: Numerical data are given as median (25th-75th percentiles) and categorical data as number (%)

Regarding their educational status, 58 participants (35.3%) had primary school or below level of education, 57 (34.8%) had middle or high school level of education, and 49 (29.8%) had university or higher-level education. Among the patients, 75 (45.7%) had chronic illnesses, and 83 (50.6%) were using at least one medication.

For the section of the survey aimed at measuring patients' knowledge about anesthesia, the minimum score that was obtained was 2, and the maximum score observed was 17. Of the participants, 89 (54.3%) were categorized as having "high knowledge levels" as they scored above the median value, as shown in.

In the section of the survey measuring satisfaction with outpatient clinic services, the minimum and maximum observed scores were 7 and 35, respectively. Of the participants, 84 (51.2%) were categorized as having "high satisfaction levels" as they scored above the median value, as shown in Table 2.

Table 2. Patients' level of knowledge about anesthesia and anesthesiologist's duties and outpatient clinic satisfaction levels

Knowledge level	11 (9-12)
Low level of knowledge	75 (45.7)
High level of knowledge	89 (54.3)
Satisfaction level	30 (26-34)
Low satisfaction level	80 (48.8)
High satisfaction level	84 (51.2)

Note: Numerical data are given as median (25th-75th percentiles) and categorical data as number (%)

Regarding the section of the survey related to anesthesia and the anesthesiologist's duties, participants provided the highest percentage of correct answers (82.3%) to the question "Who administers anesthesia during surgery?" The lowest percentage of correct answers (7.9%) was observed for the question "Who manages your early postoperative pain?" For true/false questions, the lowest percentage of correct answers (29.3%) was observed for the question "An anesthesiologist monitors blood loss during surgery and administers blood, if necessary," as shown in Table 3.

In the satisfaction section of the survey, satisfaction scores were generally high for most questions, with some exceptions. For questions 1, 5, 6, and 7 of the survey (see Appendix), participants' responses of "agree" or "strongly agree" were 94.5%, 90.2%, 89.6%, and 90.3%, respectively. However, only 64% of participants were satisfied with the statement "Adequate information was provided about the anesthesia procedures to be performed and their possible side effects," and 69.5% were satisfied with the statement "Adequate information was provided about the medications you need to stop or take before surgery." The lowest satisfaction rate (54.2%) was observed for the statement "You were informed about how long you should refrain from consuming liquids/solid foods before surgery."

Significant differences were observed in the variability of knowledge level scores according to the categorized education levels of the participants; For "Elementary school and below," "Middle and high school," and "University and above," the mean knowledge level scores were 9.93±2.56, 10.5±2.67, and 11.4±2.23, respectively (ANOVA, p=0.008). In pairwise comparisons between the groups, it was determined that this difference existed between the "Elementary school and below" and "University and above" groups (Tukey post-hoc test, p=0.009) No significant differences were found in demographic data, educational level, and history of previous surgeries

Table 3. Descriptive statistics of the knowledge level questions of the questionnaire about anesthesia and anesthesiologist's duties

Questions and answers	**n (%)**
Who is an anesthesiologist	
Nurse	5 (3.0)
Technician	16 (9.8)
General practitioner	11 (6.7)
Assistant doctor	25 (15.2)
Specialist doctor*	107 (65.2)
How anesthesia is administered	
By intravenous medication	49 (29.9)
By sniffing gas	9 (5.5)
Only the surgical area is anesthetized	13 (7.9)
All*	93 (56.7)
Who administers anesthesia during surgery	
The doctor who performs the surgery	9 (5.5)
Assistant of the doctor who performs the surgery	5 (3.0)
Anesthesiologist*	135 (82.3)
Nurse	9 (5.5)
Technician	6 (3.7)
Who monitors your breathing, blood pressure and pulse during surgery?	
The doctor who performs the surgery	21 (12.8)
Assistant of the doctor who performs the surgery	30 (18.3)
Anesthesiologist*	60 (36.6)
Nurse	44 (26.8)
Technician*	9 (5.5)
Who intervenes if there is a problem with breathing or circulation during surgery	
The doctor who performs the surgery	101 (61.6)
Assistant of the doctor who performs the surgery	19 (11.6)
Anesthesiologist*	33 (20.1)
Nurse	8 (4.9)
Technician	3 (1.8)
Who takes care of your pain in the early postoperative period	
The doctor who performs the surgery	66 (40.2)
Assistant of the doctor who performs the surgery	37 (22.6)
Anesthesiologist*	13 (7.9)
Nurse	46 (28.0)
Technician	2 (1.2)
SUGGESTİONS	**Number of correct answers n (%)**
The anesthesiologist decides whether the patient is suitable for surgery (T)	144 (87.8)
The anesthesiologist decides how long before surgery the patient will stop eating and drinking (T)	117 (71.3)
The anesthesiologist decides on the medications the patient should take and discontinue before surgery (T)	125 (76.2)
The anesthesiologist administers the drugs needed for anesthesia before and during surgery (T)	139 (84.8)
An anesthesiologist performs the patient's surgery (F)	157 (95.7)
Anesthesiologist performs regional anesthesia (T)	137 (83.5)
Anesthesiologist monitors parameters such as blood pressure, pulse, respiration during surgery (T)	99 (60.4)
The anesthesiologist monitors blood loss during surgery and gives blood if necessary (T)	48 (29.3)
Anesthesiologist can work in intensive care (T)	97 (59.1)
The anesthesiologist organizes all treatment of the patient on the ward (F)	140 (85.4)
An anesthesiologist resuscitates patients by applying life support when necessary (T)	88 (53.7)

Note: Data are given in numbers and percentages. *Correct answer. T, true; F, false

between the groups categorized by low and high knowledge level scores, as shown in Table 4, Figure 2 and Figure 3.

Table 4. Distribution of parameters in low and high knowledge groups

	Low level of knowledge (n = 75)	High level of knowledge (n = 89)	P
Age (year)			
18-34	17 (43.6)	22 (56.4)	0.171
35-49	33 (55.0)	27 (45.0)	
50-65	25 (38.5)	40 (61.5)	
Gender			
Male	28 (51.9)	26 (48.1)	0.270
Female	47 (42.7)	63 (57.3)	
Education status			
Primary school and below	32 (55.2)	26 (44.8)	0.063
Middle and high school	27 (47.4)	30 (52.6)	
University and above	16 (32.7)	33 (67.3)	
Previous surgery			
Yes	51 (45.9)	60 (54.1)	0.936
No	24 (45.3)	29 (54.7)	

Note: Data are given in numbers and percentages

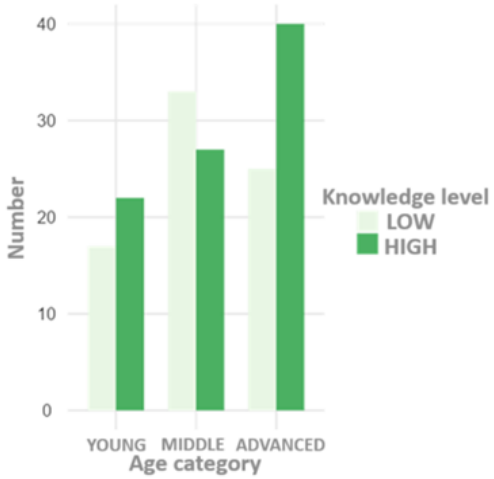

Figure 2. Distribution of knowledge level ratings by age categories
* Young: 18-34 years, middle: 35-49 years, advanced: 50-65 years. p = 0.171

Finally, correlations were examined between age, educational level, number of chronic diseases, number of medications used, total knowledge level, and total satisfaction scores. A weak positive correlation was found between educational level and total knowledge level (Spearman rho=0.240, p=0.002). Similarly, a weak positive correlation was found between total knowledge level and total satisfaction score (Spearman rho=0.285, p<0.001), as shown in Table 5.

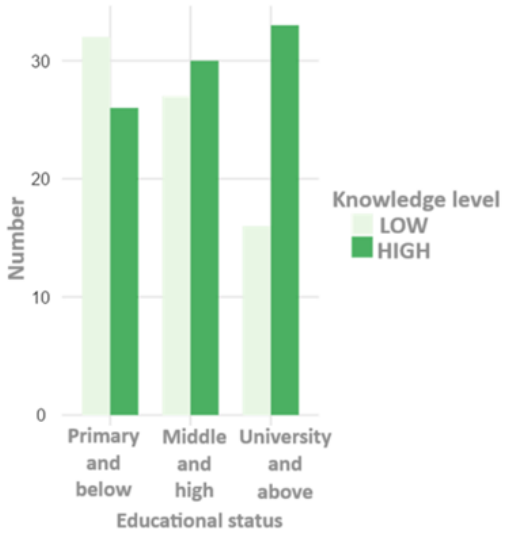

Figure 3. Distribution of knowledge level ratings according to educational status categories
* p = 0.063

Table 5. Correlation table between age, education level, number of chronic diseases, number of medications used, total level of knowledge and total satisfaction scores

	Age	Education	Number of chronic diseases	Number of medications used	Level of knowledge	Satisfaction score
Age						
Education	rho:0.442 p <0.001*					
Number of chronic diseases	rho: 0.434 p <0.001*	rho: 0.273 p <0.001*				
Number of medications used	rho: 0.384 p <0.001*	rho: 0.217 p = 0.005*	rho: 0.720 p <0.001*			
Level of knowledge	rho: 0.055 p = 0.483	rho: 0.240 p = 0.002*	rho: 0.022 p = 0.777	rho: 0.073 p = 0.352		
Satisfaction score	rho: 0.053 p = 0.497	rho: 0.109 p = 0.163	rho: 0.049 p = 0.535	rho: 0.057 p = 0.466	rho: 0.285 p <0.001*	

Note: Spearman test was used. *p <0.05

DISCUSSION

The main finding of our study was that patients attending the anesthesia clinic for preoperative assessment had insufficient knowledge about the duties of anesthetists, yet most patients reported high satisfaction scores. The median score obtained for the section of our survey regarding the duties and responsibilities of anesthetists, which consisted of a total of 17 points, was 11. While some patients answered all questions correctly in this section, there were also those who scored only 2 points. In the literature, there are varying results from different countries regarding the public's knowledge about the duties of anesthetists. In a study by Gottschalk et al.,[3] it was found that in the United States, Australia, and Germany, the rates of knowing that anesthetists work in intensive care

units (ICUs) ranged from 42 to 71%. Looking at various studies conducted in our country, in the study by Türkyılmaz et al.,[2] this rate was 22%, while in the study by Sagün et al.,[12] it was 4%. In our study, 59% of the participants stated that anesthetists could work in ICUs.

One of the least known areas regarding anesthetists is their responsibility for acute postoperative pain management. The rates of having an idea about this issue in the literature vary between 3.5-67%.[1,13-17] In our study, only 7.9% of the patients had correct knowledge about this, which was the question with the lowest correct response rate in our survey. Another question with a low rate of correct responses in our survey was about the responsibilities of anesthetists in perioperative bleeding monitoring and[1] transfusion management. In a recent study, Kayaaltı[1] found this rate to be around 14%. It's worth considering that his study was conducted in a district state hospital, which she also emphasized in her article. In the study by Türkyılmaz et al.,[2] this rate was around 29%, which was consistent with the numbers in our study.

Despite the disappointingly low rates of knowledge, participants' satisfaction scores were quite high. In our survey, nearly 90% of the participants indicated satisfaction in four out of the seven questions we prepared regarding satisfaction. However, there were still areas where they were not satisfied, and we would like to draw attention to these. Participant satisfaction rates regarding information about the anesthesia procedures and possible side effects, medications that should or should not be taken preoperatively, and preoperative fasting duration were around 50-70%. Especially regarding preoperative fasting, it is an important issue that requires attention due to potential serious morbidities such as postponement of the elective surgery or vomiting-aspiration if not adhered to. Due to limited time in preoperative assessment units, communication difficulties with patients, and uncertainty about the surgery date, unfortunately, we anesthetists often delegate the responsibility of informing patients about preoperative fasting to surgeons, and sometimes even to ward nurses. Considering issues that may arise in patients with comorbidities like diabetes mellitus or prolonged fasting duration, it would be more appropriate for anesthetists to provide detailed information on this matter. Instead of applying a rule like "no eating or drinking after midnight" to all patients, implementing personalized protocols would be a more accurate approach. The proportion of individuals in the community who are aware of the anesthetist's role in preoperative fasting duration ranges from around 32 to 54% in our national studies.[1,2] In our study, this rate was 54.2%, which was consistent with the literature.

In our study, participants were categorized into three educational levels: 1) Primary school or below, 2) Middle and high school, 3) university and above. When comparing these three educational categories, it was found that individuals with primary school education or below had significantly lower levels of knowledge about the duties of anesthetists compared to those with university or above-level education (9.93±2.56 and 11.4±2.23, respectively, p=0.008). Moreover, we had identified a weak but significant positive correlation between educational level and total knowledge level. Frankly speaking, it is ambiguous whether this difference in numbers would be significant enough in reality or whether it would have a considerable impact on patients' clinical outcomes. Indeed, when patients were grouped as having low or high levels of knowledge, no significant differences were found between them in terms of age, gender, education level, or surgical history. In studies by Yoldaş et al.,[10] more than half of the patients had a high level of education, yet a significant portion stated that they did not even know why they were referred to the anesthesia clinic. Studies show significant differences between countries. In the literature, the percentage of individuals who know that an anesthetist is a physician varies between 20-95% in different countries.[18-22] It is not entirely correct to attribute this issue solely to education. Allocating sufficient time for preoperative patient preparation and informing them by an anesthetist during the polyclinic visit would largely address this issue. It is important to organize the workflow and personnel of anesthesia clinics accordingly. National press and media can also play an important role in raising public awareness about the duties of anesthetists.

Having a high level of knowledge about anesthesia and anesthetists can increase patient satisfaction. In our study, we had identified a weak but positive correlation between knowledge level and satisfaction. A high level of knowledge not only affects subjective measures like satisfaction but also influences the patient's anxiety. There are studies in the literature demonstrating a significant relationship between knowledge level and anxiety.[23,24] As knowledge level increases, anxiety decreases. While some anxiety is normal in the preoperative period, excessive anxiety can lead to dysfunction of the autonomic nervous system, tachycardia, hypertension, arrhythmia, and increased need for anesthetic drugs.[25-30] High levels of anxiety have been associated with high postoperative pain scores, increased incidence of nausea and vomiting, and prolonged recovery.[31]

Limitations

We had some limitations in our study. First, the participants largely came from a specific region, representing only the geography they live in. Data obtained from regions with different sociocultural levels may yield different results. Second, we did not use a scale for anxiety in our study. Therefore, we could not objectively examine the relationship between knowledge level and anxiety.

CONCLUSION

Our study revealed that patients visiting the anesthesia clinic had insufficient knowledge about the duties of anesthetists, yet their satisfaction scores were high. Although there was a numerical difference between education and knowledge levels, it is uncertain whether these values are significant enough to be reflected in clinical outcomes. It is crucial for patients undergoing preoperative preparation to be adequately informed by an anesthetist with sufficient time

allocated in the polyclinic. It may be beneficial to organize the logistics of anesthesia clinics accordingly and involve the national press and media in raising awareness in the public.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of Marmara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 06.01.2023, Decision No: 09.2023.97).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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