

# Patients' concerns and perceptions of anesthesia-associated risks at University Hospital: A cross-sectional study

## ABSTRACT

**Background/Aim:** The expectation of undergoing general anesthesia triggers fear in many individuals, and such anxiety can even exceed anxiety about surgery. The only opportunity patients usually have to express their concerns and ask questions is during a preoperative visits to their anesthesiologist. Therefore, a good anesthesiologist-patient relationship is important to reduce patients' anxiety. Achieving this end requires information on patients' attitudes and concerns regarding anesthesia. This study aimed to assess patients' knowledge, attitudes, and concerns about preoperative assessment and fear associated with anesthesia at University Hospital, Jeddah, Saudi Arabia.

**Methods:** This cross-sectional study used a self-administered questionnaire distributed to 399 outpatients. Data were collected on patient's characteristics, perceptions about anesthesiologists, preferences for anesthetic management, and preoperative concerns regarding anesthesia.

**Results:** Most patients thought that anesthesiologists spent only 3 years in medical school and 2 years in a residency program. Survey participants had several misconceptions about anesthesiologists' role, but it did not affect ratings of their importance. Although, the confidence of patients in anesthesiologists was high, it was significantly lower than their confidence in surgeons. The most common concern expressed by the patients was based on whether anesthesiologists had sufficient experience and qualifications.

**Conclusions:** Discussing anesthetic forms preoperatively can help decrease patients' anxiety. More efforts should be made preoperatively to address patients' high level of fear about rare side effects and discuss common side effects they tend to ignore. Preoperative preparation must allow the anesthesiologists enough time to reassure patients about their concerns, as they obtain patients' informed consent.

**Key words:** Anesthesia knowledge; attitudes; concerns; risks

## Introduction


The possibility of undergoing general anesthesia frightens numerous individuals throughout the world. To some, the prospect of going under general anesthesia scares them more

than the possibility of the actual surgery.<sup>[1,2]</sup> Furthermore, most patients endure preoperative anxiety, which is directly related to the patient's greatest concern. A good

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anesthesiologist-patient relationship has been shown to have a positive effect on patients by reducing their anxiety.<sup>[3-5]</sup> Therefore, it is important to establish good relationships with patients during preoperative visits.

Complete information about anesthetic management and patient's concerns about anesthesia must be obtained to achieve desired outcomes. A study conducted in Brooklyn, NY, found that only 5% of patients were aware of the fact that anesthesiologists played a major role in monitoring vital signs. Almost 7 out of 10 (69%) had a strong preference for general anesthesia instead of regional anesthesia, and it seems that the number of patients with such a preference is increasing.<sup>[6]</sup> The majority of patients in that study were afraid of not waking up, experiencing pain, and facing the possibility of a disability. It has been established that more communication with patients is required to reduce their anxiety about the effects of anesthesia.<sup>[6]</sup> A study in Edmonton, Canada, found that most of the general population considered anesthetic assessment on the day prior to surgery to be an important part of preoperative preparation. As the fear of general anesthesia remains prevalent, especially with regard to possible brain damage, death, and intraoperative awareness, preoperative education should be provided to patients.<sup>[7]</sup>

A search of the literature indicated that relatively few studies have been conducted to evaluate the patient's ideas about anesthesia. Although a large number of studies have focused on patients' knowledge about the surgery itself, in particular, these studies did not consider anesthesia. In conclusion, we found there were not enough studies conducted in Saudi Arabia to gain insight into the public's knowledge, attitudes, and concerns regarding preoperative assessment and the risks associated with anesthesia. Therefore, the aim of this study was to survey outpatients at University Hospital about their knowledge, attitudes, and concerns related to preoperative assessment and their fear of anesthesia. The basic research question was whether knowledge, attitudes, and concerns varied by age, sex, and prior experience.

## Materials and Methods

The study, which was conducted in 2018, was approved by the Institutional Review Board of KAU Hospital, which is a large metropolitan tertiary care center located in Jeddah, in the Western Region of Saudi Arabia. This cross-sectional study was conducted to assess the knowledge, attitudes, and concerns of KAU Hospital outpatients related to preoperative assessment and the risks associated with anesthesia.

A self-administered pencil and paper questionnaire was distributed to the target sample. The questionnaire was divided into four parts. The first part obtained data on patient characteristics (age, gender, and educational level). The second part measured patients' perceptions of anesthesiologists' training and roles (eight items): for example, whether they knew the number of years anesthesiologists are required to attend medical school and residency training; whether they knew the role of anesthesiologists; what level of confidence patients had in anesthesiologists and surgeons; and what importance they accorded to anesthesiologists, surgeons, and medical doctors. The third part measured patients' preferences for anesthetic management: (a) the patients were asked if they previously had surgical operations—if yes, what type of anesthesia was used and why; (b) another set of questions asked patients if they had a preference regarding the type of anesthesia prior to the operation, and (depending on whether they answered yes or no) the reason for their decision to choose a particular type of anesthesia. The fourth part asked patients about their preoperative concerns regarding negative experiences and adverse events related to anesthesia (23 questions) that represent four factors: (a) specific complications of anesthesia; (b) characteristics of the anesthesiologist; (c) anxiety about being hospitalized; and (d) pain. The questionnaire was completed by the patients after they gave written informed consent for their answers to be used in our research. No names were requested on the questionnaires.

The total number of participants was 399 which was calculated using Raosoft site,<sup>[8]</sup> all of whom were from outpatient clinics and were 18 years of age or older. Patients who refused to participate and those who were unable to answer questions because of their inability to understand Arabic were excluded. An informed written consent was obtained from all the patients included in this study for their images and other clinical information to be published in scientific journal after explanation the goal of the study to them.

After the data were collected, a coding guide was used to help enter the printed data into the statistical analysis software (SPSS; version 21) program. Descriptive statistics were obtained for the patients' demographic characteristics and measures on the training and role of the anesthesiologist, patients' opinions regarding anesthetic management, and their types and levels of concern regarding anesthesia. Patients' opinions regarding anesthetic management were coded as 1, 2, and 3 for general, local, and spinal/epidural anesthesia, respectively. The Chi-square ( $\chi^2$ ) test and correlations were used to determine the associations among demographic characteristics (gender, age, and educational level), previous

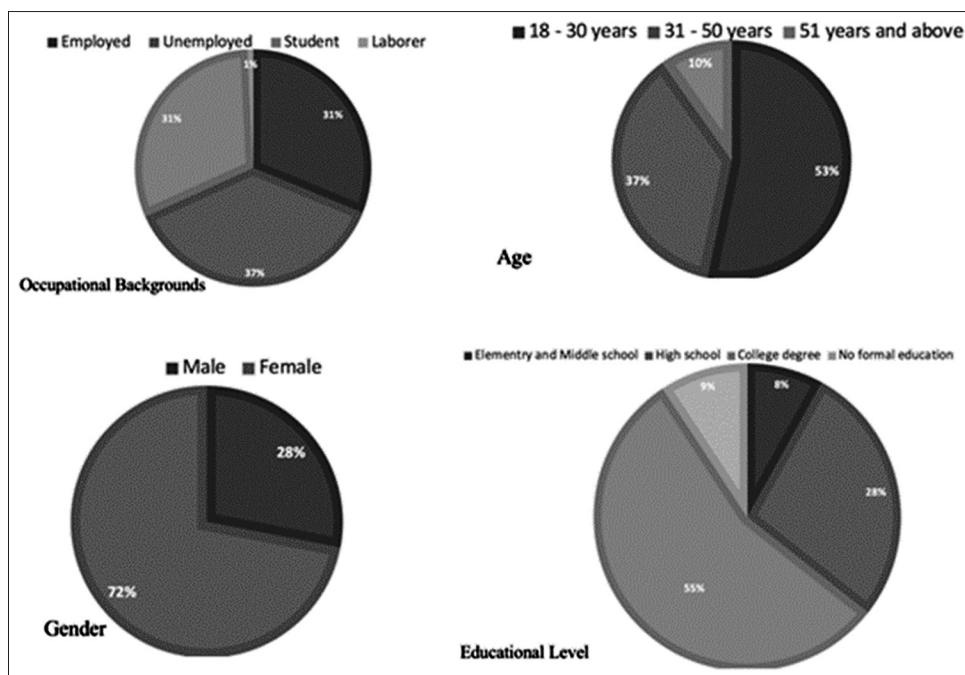


Figure 1: The occupational backgrounds, age, gender, and educational level of the respondents (n = 384)

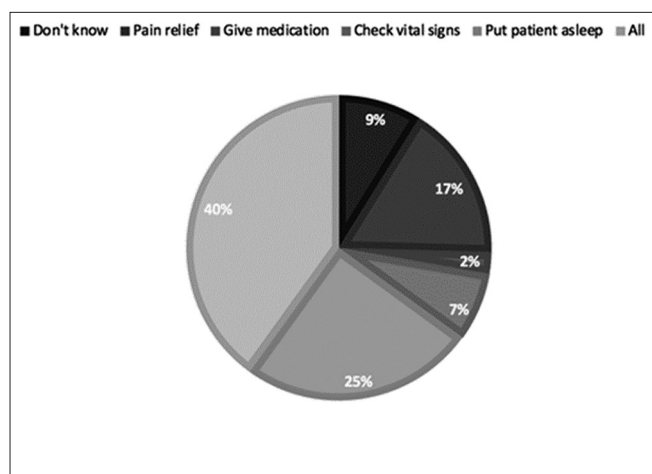


Figure 2: Choosing the type of anesthesiologist

experience with anesthesia, and patients' concerns. Independent-sample *t*-tests were performed to compare patients' opinions about the importance of anesthesiologists and other medical doctors. A  $P \leq 0.05$  was considered significant.

## Results

### Patients' characteristics

The final sample consisted of 384 consecutive outpatients who were consenting adults at KAU Hospital. The patients included 111 men and 285 women (age range = 31–50 years) with an average educational level of a bachelor's college degree. Although most patients answered all the survey

questions, the number of patients in the analyses varied because there were missing data on few of the surveys. Forty-four percent of the patients did not undergo surgery and 57% of patients underwent surgery, of which 19% had a gynecologic procedure, 5% had an orthopedic procedure, 4% had a genitourinary procedure, 2% had a colorectal procedure, 6% had a gastrointestinal procedure, 4% had a cardiology procedure, and 17% had various other procedures. Patient characteristics backgrounds are summarized in Figure 1.

### Perceptions of the anesthesiologist's training and role

Patients' knowledge about the medical school and residency training of anesthesiologists demonstrated that they believed anesthesiologists spent an average of 3 years in medical school ( $SD = 3.13$ ) and an average of 2 years in residency training ( $SD = 2.23$ ). The median and modal scores for both medical school and residency training were zero, which indicated that most of the patients did not know the exact length of time needed to become an anesthesiologist. Figure 2 shows patients' knowledge of the anesthesiologist's role. In general, the level of confidence that the patients had in anesthesiologists was high (mean = 3.70,  $SD = 1.098$ , range = 1–5). Confidence in anesthesiologists did not differ significantly between the patients who encountered and those who did not encounter them ( $t$ -test = -0.698,  $P = 0.491$ ). Although the confidence of patients in anesthesiologists was high, it was significantly lower than their confidence in surgeons (mean = 3.90,  $SD = 1.11$ ,  $P < 0.001$ ). As previously mentioned, the survey included questions related to the patients' opinions about

the importance of anesthesiologists, surgeons, and medical doctors. Overall, the results showed that patients' ratings of the importance of anesthesiologists and medical doctors did not differ significantly ( $t$ -test = 2.223,  $P$  = 0.027). Comparisons of specialists and surgeons found that surgeons were rated significantly higher ( $t$ -test = -4.130,  $P$  < 0.001). Surgeons were also rated more important than were medical doctors ( $t$ -test = 5.978,  $P$  < 0.001).

**Patients' preferences for anesthetic management**

The majority of the patients who had surgery (55%) were unwilling to select their own form of anesthetic management. This was primarily because they were not familiar with any type (17%), believed they were unqualified to select one (2%), or it did not matter to them (24%). Twenty-four percent of the patients believed that their surgeon should make that decision. Among the 45% of the patients who preferred to

choose one, 29% expressed a desire to have complete control over such a choice and 66% preferred to choose one because they believed that a patient's opinion should be considered. These results are presented in Table 1.

About 40% of patients had undergone surgery previously and had general anesthesia. The reasons for this were: they did not know why (9%); they did not want to be awake during the surgery (12%); they thought it had the same side effects as spinal anesthesia (1%), and it was their doctors' decision (14%). Twelve percent of the patients had spinal anesthesia, of which, 2% did not know why, 5% wished to stay awake and aware during the procedure, 2% wanted to avoid the side effects of general anesthesia, and 3% said it was their doctor's decision. Only 5.3% of the patients had local anesthesia. However, 2% of them did not know why 2% preferred to be awake during the surgery, 1% wanted to avoid the side effects of general anesthesia, and 0.3% stated that it was their doctor's decision.

**Table 1: Choosing the anesthesiologist (n=225)**

Patient preferred to make a choice	% patients	Reasons	%
Yes	45%	Patient should control choice	29%
		Patient opinion should be considered	66%
No	55%	Patient does not know the reason	17%
		Patient left the decision to the surgeon	51%
		It does not matter	24%
		Patient not qualified	2%

**Patients' preoperative concerns**

As mentioned earlier, patients who had been hospitalized and received anesthesia rated 23 concerns. Table 2 shows the number of patients who chose "extremely" as their degree of concern about each negative experience or adverse event. The percentages are arranged in descending order from the highest to the lowest concern in the table, and concern is

**Table 2: Issues of concern (n=399)**

Degree of concern	Questions	% Patients
Highest concern	Having an anesthesiologist with inadequate experience	28.8
	Having an anesthesiologist with qualifications	25.0
	Being unable to wake up from the anesthesia	23.3
	Becoming paralyzed because of the anesthesia	23.0
	Afraid of death	22.8
	Feeling pain after the operation	22.8
	Having to stay in the ICU for a prolonged period	21.8
Moderate concern	Waking up in the middle of the operation	19.2
	Disclosing personal matters involuntarily while under anesthesia	18.8
	Anesthesia causing brain damage	18.8
	Afraid of being nude	16.5
	Letting yourself fall into an unconscious state	16.3
	Being afraid of the unknown	16.0
	Not having medication in time to relieve your pain or discomfort	14.5
Least concern	Anesthesia affecting the clarity of your thoughts	13.3
	Whether the anesthesiologist will stay throughout the operation	12.8
	Being asleep for a long time after the operation	12.8
	Anesthesia impairing your judgment	12.3
	Being nauseous after the operation	12.0
	Feeling nervous in the hospital environment	11.0
	Being afraid of needles	10.0
	Having a headache after the operation	9.8
The anesthesiologist's bedside manners	9.8	

OR=Operating room; ICU=Intensive care unit

**Table 3: Correlations between patient's demographics and intensity of concern**

Degree of concern	Questions	Age	Education
Highest-rated concerns	Having an anesthesiologist with inadequate experience	0.10 0.04	-0.04 0.45
	Having an anesthesiologist who is qualified	0.077 0.13	-0.03 0.50
	Being unable to wake up from the anesthesia	0.08 0.11	-0.103 0.044
	Becoming paralyzed because of the anesthesia	0.12 0.02	-0.13 0.01
	Afraid of death	0.02 0.76	-0.02 0.66
	Feeling pain after the operation	0.02 0.62	-0.01 0.77
Medium-rated concerns	Having to stay in the ICU for a prolonged period	0.12 0.02	-0.09 0.08
	Waking up in the middle of the operation	-0.16 0.00	0.14 0.01
	Disclosing personal matters involuntarily while under anesthesia	-0.1 0.05	0.09 0.07
	Anesthesia causing brain damage	0.03 0.58	-0.05 0.31
	Afraid of being nude	-0.02 0.72	-0.03 0.58
	Letting yourself fall into an unconscious state	-0.06 0.21	0.01 0.78
Lowest-rated concerns	Afraid of the unknown	-0.02 0.65	0.05 0.38
	Not having medication in time to relieve your pain or discomfort	0.00 0.94	-0.03 0.57
	Anesthesia affecting the clarity of your thoughts	-0.02 0.64	0.03 0.59
	Whether the anesthesiologist will stay throughout the operation	-0.04 0.41	-0.03 0.63
	Sleeping for a long time after the operation	0.02 0.68	-0.05 0.39
	Anesthesia impairing your judgment	0.03 0.58	-0.04 0.47
	Being nauseous after the operation	0.07 0.17	-0.08 0.11
	Feeling nervous in the hospital environment	0.09 0.05	-0.09 0.07
	Being afraid of needles	-0.01 0.68	0.07 0.20
	Having a headache after the operation	0.01 0.82	-0.07 0.21
The anesthesiologist's bedside manner	-0.04 0.44	-0.02 0.64	

ICU=Intensive care unit, \*Correlation and P

divided into three categories: highest, moderate, and lowest level of concern. The concern that patients rated highest was whether the anesthesiologist had sufficient experience and qualifications to perform their role during the surgery.

**Correlates of patients' preoperative concerns**

The associations between the degree of patients' concerns and their age and educational level were examined using

**Table 4: Preoperative responses on factors by patient's sex**

Concerns	Gender	n	Mean	SD	P
<b>Anxiety about hospitalization</b>					
Feeling nervous in the hospital environment	Male	110	2.23	1.35	0.12
	Female	284	2.46	1.34	
Afraid of the unknown	Male	110	2.08	1.27	0.00
	Female	282	2.91	1.44	
Afraid of needles	Male	110	1.9	1.25	0.00
	Female	277	2.43	1.42	
Afraid of being nude	Male	111	1.83	1.16	0.00
	Female	273	2.98	1.52	
<b>Pain</b>					
Waking up in the middle of the operation	Male	110	2.15	1.39	0.00
	Female	279	2.87	1.58	
Feeling pain after the operation	Male	109	2.96	1.48	0.00
	Female	279	3.42	1.32	
Not having medication in time to relieve your pain or discomfort	Male	107	2.24	1.34	0.00
	Female	271	2.72	1.49	
<b>Anesthesia Complications</b>					
Letting yourself fall into an unconscious state	Male	110	2.57	1.38	0.00
	Female	279	3.01	1.54	
Disclosing personal matters involuntarily while under anesthesia	Male	109	2.23	1.42	0.00
	Female	274	2.82	1.58	
Anesthesia affecting the clarity of your thoughts	Male	111	2.2	1.45	0.02
	Female	282	2.59	1.45	
Anesthesia causing brain damage	Male	109	2.34	1.49	0.02
	Female	283	2.78	1.54	
Anesthesia impairing your judgment	Male	109	2.17	1.44	0.16
	Female	285	2.39	1.46	
Being asleep for a long time after the operation	Male	110	2.48	1.39	0.46
	Female	279	2.6	1.45	
Afraid of death	Male	110	2.45	1.52	0.00
	Female	281	2.97	1.6	
Having to stay in the ICU for a prolonged period	Male	109	2.73	1.52	0.02
	Female	279	3.12	1.43	
Being nauseous after the operation	Male	111	2.2	1.28	0.00
	Female	283	2.65	1.39	
Having a headache after the operation	Male	110	2.17	1.33	0.01
	Female	280	2.58	1.33	
Becoming paralyzed because of the anesthesia	Male	108	2.62	1.56	0.01
	Female	281	3.06	1.57	
Being unable to wake up from the anesthesia	Male	110	2.65	1.51	0.01
	Female	279	3.09	1.55	
<b>Anesthesiologist's characteristics</b>					
The anesthesiologist's bedside manner	Male	111	1.95	1.24	0.00
	Female	282	2.48	1.427	
Whether the anesthesiologist will stay throughout the operation	Male	111	2.19	1.40	0.02
	Female	281	2.58	1.48	
Having an anesthesiologist who is qualified	Male	111	2.96	1.48	0.05
	Female	283	3.28	1.47	
Having an anesthesiologist with adequate experience	Male	111	2.98	1.56	0.02
	Female	282	3.39	1.49	

ICU=Intensive care unit

Pearson's correlations and rank-order correlations [Table 3]. The results showed that older patients were more concerned

about the anesthesiologist being experienced and most concerned about becoming paralyzed and staying in the ICU for a prolonged period. Education was negatively correlated with concerns about becoming paralyzed and being unable to wake up after the operation. The Chi-square test was used to investigate the effect of gender on "What concerned you the most?" The patient's sex was the independent variable and the type of concern was the dependent variable. Most females were concerned about not waking up after the surgery, while most males were concerned about having pain after the surgery ( $\chi^2 = 11.168, P = 0.515$ ). No significant associations were found between gender and other types of concerns. Independent sample *t*-tests were performed to examine the associations between different types of concerns with the patient's sex [Table 4]. Overall, females were more concerned than males about nearly all possible negative experiences and events, such as anxiety about hospitalization, pain, anesthesia complications, or the anesthesiologist's characteristics.

The Chi-square test was performed to assess the effect of encountering the anesthesiologist preoperatively and subsequent level of concern. No significant relationship was found ( $\chi^2 = 23.118, P = 0.513$ ), which indicated that "not being able to wake up," "pain during surgery," "pain after surgery," "not being able to go back to normal life," or "no concerns" were not dependent on meeting the anesthesiologist preoperatively. Patients' responses depended on the type of anesthesia (general, spinal, or local). Patients who had general anesthesia were more concerned about not being able to resume a normal life, whereas patients who had local anesthesia were concerned about pain during surgery. However, no significant association was found between different types of concerns and types of anesthesia ( $\chi^2 = 10.768, P = 0.549$ ).

## Discussion

The main aim of this research was to assess the knowledge, attitudes, and concerns of patients about the preoperative assessment and the risks associated with anesthesia. As there was no data available in our country that could give us a better understanding of the general population, this research was conducted at University Hospital.

To assess patients' knowledge, a set of questions was developed that focused on the public's awareness of the various roles of anesthesiologists. The responses showed that most patients had little knowledge of anesthesiologists, and a few had a better understanding. Anesthesiologists play key roles in the operating theater and their work includes inserting difficult IV lines, performing vital intubations, and

even maintaining extremely unstable cases. The stability of the patient's vital signs and state are monitored by the anesthesiologist to help the surgeon work throughout the operation without interruption to achieve better patient outcomes. Given the study's results, it is obvious that many patients are unaware of the anesthesiologist's role in pain management during and after their surgery. Overall, the patients' perceptions of anesthesiologists were limited to their role in the operating room. Therefore, efforts should be made to raise the awareness of the public to give anesthesiologists the credit they deserve.

Choosing a particular form of anesthetic management depends on many factors, and it is often based on the considerable knowledge and experience that an anesthesiologist has. The results showed that 24% of the patients believed that it was the surgeon's choice, which is a misconception that needs to be corrected. Such a decision should be made only by anesthesiologists, as they are able to provide management options as well as the best alternatives for patients. Many patients choose their anesthesia type based on whether or not they prefer to stay awake during the procedure. This reason is very general and is not a valid reason for making such a decision. Upon closer examination of the results, it is apparent that many patients are unaware of the side effects of each form of anesthesia. It was also found that some patients did not know why a given type of anesthesia was used. Therefore, preoperative visits should include more communication with patients to increase their knowledge about the side effects of anesthetic forms and the reasons, including the pros and cons, for choosing a form of anesthesia.

Patients' preoperative concerns were assessed based on four factors. It was troubling to find that the highest levels of concerns fell under the factor "characteristics of the anesthesiologist." The two greatest concerns were whether the anesthesiologist was experienced and qualified. It was disturbing to find the low levels of trust the patients had in anesthesiologists. Such concerns can be decreased by building a better patient-doctor relationship, preoperatively. Not being able to wake up, becoming paralyzed, death, postop pain, and staying in the ICU were all concerns rated highest by the patients. Death and not being able to wake up from anesthesia can occur during general anesthesia, but they are very rare. Postoperative pain is caused by the surgery and is managed by anesthesia. Most of the men that answered the survey expressed high concern about pain. Moderate levels of concern were found for the items that were part of the factor that assessed anxiety related to being hospitalized. Patients also expressed moderate concern about waking up

in the middle of the operation. Unintended intraoperative awareness is infrequent, and a very rare complication. The patients were less worried about realistic side effects, which is similar to the results found in similar studies.<sup>[4]</sup> Patients were least concerned about the most common side effects (another one of the four factors of concerns), including nausea, headache, impaired judgment postoperatively, and alternations in the clarity of thought, such as postoperative confusion. The patients were also least concerned about hospital anxiety and needles. Therefore, preoperative visits should include educating patients more and addressing their concerns to enhance patient care.

In conclusion, patients' confidence in anesthesiologists was found to be high. Although patients had some misconceptions, they did not affect the way patients rated the importance of the anesthesiologist's role. More efforts should be made preoperatively to address patients' fears of rare side effects, which are very prevalent concerns, as well as the common side effects that patients tend to ignore. Preoperative preparation must allow anesthesiologists the time to reassure patients about their concerns as they obtain patients' informed consent.

This research, however, is subject to limitations. First, the study focused on patients from one academic hospital in Jeddah, Saudi Arabia. The findings from this study might not be generalized to patients in other regions of Saudi Arabia or in other countries. The second limitations concern the sample. The study used a convenience sample that included outpatients only as inpatients were excluded.

#### **Declaration of patient consent**

None.

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#### **Conflicts of interest**

There are no conflicts of interest.

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