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ORIGINAL INVESTIGATION

Patient satisfaction in ambulatory anesthesia assessed by the Heidelberg Peri-anaesthetic Questionnaire: a cross-sectional study

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KEYWORDS

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Abstract

Background: Service quality in anesthesiology has been frequently measured by morbidity and mortality. This measure increasingly considers patient satisfaction, which is the result of care from the client’s perspective. Therefore, anesthesiologists must be able to build relationships with patients, provide understandable information and involve them in decisions about their anesthesia. This study aimed to evaluate the peri-anesthetic care provided by the anesthesia service in an ambulatory surgery unit using the Heidelberg Peri-anaesthetic Questionnaire.

Methods: This cross-sectional study used the Heidelberg Peri-anaesthetic Questionnaire to evaluate 1211 patients undergoing ambulatory surgery. We selected questions that showed a greater degree of dissatisfaction and correlated them with patient characterization data (age, sex, education, and ASA physical status), anesthesia data (type, time, and prior experience), and surgical specialty.

Results: Questions in which patients tended to show dissatisfaction involved fear of anesthesia and surgery, feeling cold, the urgent need to urinate, pain at the surgical site, and the team’s level of concern and speed of response in relieving the patient’s pain.

Conclusion: The Heidelberg Peri-anaesthetic Questionnaire proved to be a useful tool in identifying points of dissatisfaction, mainly fear of anesthesia and surgery, feeling cold, the urgent need to urinate, pain at the surgical site, and the team’s level of concern and speed of response in relieving the patient’s pain in the population studied. These were correlated with patient, anesthesia, and surgical variables. This allows the establishment of priorities at the different points of care, with the ultimate goal of improving patient satisfaction regarding anesthesia care.

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Introduction

Modern medicine cannot be dissociated from the concept of quality, which promotes and improves habits and actions in the healthcare system as a whole. This concept is not universally understood, and many consider it to be vague and difficult to define. Some may argue that when there is competence and expertise, quality naturally follows, obviating the need for conceptualization. Donabedian,¹ however, said that despite these difficulties, it is possible to analyze the concept of quality in healthcare. The study of patient-oriented quality implies a need for constant evaluation of structure, processes, and results.

The development of access to information, especially since the 1990s, has led us to the “client era”. The previous concept of the patient as passive and uninformed has changed to one of a patient/client who is demanding, critical, and a better evaluator, who interacts in ways to defend their interests. Evaluation of results has traditionally focused on measures of morbidity and mortality and taken less into account measurements based directly on patient observations.²

In modern anesthesia, the anesthesiologist should be capable of building relationships with patients, providing understandable information, involving patients in decisions about their anesthesia, and clarifying their concerns.^{3,4}

In February 2012, the Royal College of Anaesthetists issued a position statement endorsing the view that all anesthesiologists should seek patient feedback using questionnaires, and should strive to improve relations with patients, as most complaints involve claims of poor communication.⁵ The quest for feedback has become a routine part of our work, indicating a future in which anesthesiologists are valued not only for their excellence in practical and theoretical knowledge, but also for their effective skills in communication with patients.

In the literature, satisfaction is presented as an indicator of healthcare quality, correlated with patient behavior, particularly in relation to treatment adherence.⁶ In anesthesiology, a specialization increasingly involved in perioperative care, there is a need to establish new measures for evaluating patient satisfaction.⁷

In the classic definition, satisfaction is ascertained as being based on the degree of congruence between the patient's expectations and what is achieved. The authors are aware that this is a subjective measurement, and difficult to evaluate.⁸ However, the importance of satisfaction in anesthesiology is recognized, and several questionnaires to address this metric have been published.⁹⁻¹⁶

Schiff et al.¹⁴ developed and validated a psychometric questionnaire designed to evaluate patient satisfaction in the peri-anesthetic experience: the Heidelberg Peri-anaesthetic Questionnaire. These authors considered that identifying dissatisfied patients is even more important than determining levels of satisfaction with the service. They therefore built and developed a multidimensional

questionnaire that covers different phases of anesthesia care and seeks to address possible causes of patient dissatisfaction. The study was validated for use in the Portuguese language by Moura et al.¹⁷

The questionnaire is considered a valid and reliable instrument. It is easy to apply at the end of the postoperative period and is designed to be used in cross-sectional studies.¹⁴

This study aimed to evaluate the peri-anesthetic care provided by the anesthesia service in an ambulatory surgery unit, based on the opinion of patients, by using the Heidelberg Peri-anaesthetic Questionnaire to identify points of dissatisfaction at each stage of care, and correlated them with some patient, anesthesia, and surgery variables.

Methods

This work was submitted for approval by the Medical School (FMB) of the Universidade Estadual de São Paulo (Unesp) Ethics Committee, Botucatu Campus, on February 2, 2016, and received certificate (CAAE) number 52457915.6.0000.5411 from Conep (Brazil's National Committee for Ethics in Research). After obtaining written informed consent from all study participants, we conducted a cross-sectional study applying a questionnaire to 1.211 patients undergoing surgery, in an outpatient unit between March 30 and July 31, 2016. In a pre-anesthetic consultation, the anesthesiologists screened patients who would undergo surgery at the unit, performed the anesthesia, and assessed (nonsurgical) postoperative clinical events.

A psychometric questionnaire developed and validated by Schiff et al.,¹⁴ the Heidelberg Peri-anesthetic Questionnaire, which had been translated into and validated in Portuguese by Moura et al.^{17,18} was applied. The data were collected by a nurse of the research team, who was appropriately trained not to interfere with patients' responses. Data characterizing each patient, and their anesthesia and surgery (by surgical specialty) were recorded. The data were collected when patients were awake at their hospital bed and approaching the time of discharge.

The questionnaire comprises 38 items, in which the patient assigns a degree of agreement on a four-point Likert scale (strongly disagree, disagree, agree, strongly agree), making it impossible to choose a central response. The items are placed in chronological order according to the following phases of the service provided by the anesthesiologist: pre-anesthetic consultation, the perioperative period and post-anesthetic recovery. The questions covered five aspects: trust and atmosphere; fear; discomfort; treatment by personnel; and information and waiting.

The sample size was determined with reference to what is described in the literature,^{14,17} and was intended to be representative of the hospital in full operation, considering the total number of surgeries carried out in the period of the investigation, their distribution by specialty, and the

demographic characteristics of each patient. The Heidelberg Peri-anaesthetic Questionnaire was organized as shown in Figure 1.

The inclusion criteria were age 18 or over; elective surgery; surgery with discharge expected on the same day; and absence of neuropsychiatric disease. The exclusion criteria were patients with cognitive impairment in communication; and refusal answer the questionnaire.

The following variables were also evaluated for each patient: age; sex; education; ASA (American Society of Anesthesiologists) physical status;¹⁹ type of surgery; type of anesthesia; duration of anesthesia; and prior anesthesia.

Statistical analysis

Categorical variables are described by their absolute and relative frequencies. Continuous variables with normal distribution are described by their mean and Standard Deviation (SD), and variables with non-normal distributions are described by their median and quartiles.

Mean satisfaction scores were calculated for each question. Since the perception of satisfaction on the Likert scale differs according to each question, for standardization, the scores of questions that were asked in the negative format were reversed (a score of 1 was converted to 4, and vice

PATIENT'S OPINION SURVEY SATISFACTION WITH ANESTHESIA CARE

We ask that you indicate your opinion in response to each question, marking it with one of the following:

- 1 Strongly disagree
- 2 Disagree
- 3 Agree
- 4 Strongly agree

PRE-ANESTHETIC CONSULTATION:

1. The waiting time before the consultation with the anesthesiologist was long.

1	2	3	4
---	---	---	---
2. The information was given in a pleasant environment.

1	2	3	4
---	---	---	---
3. The informing doctor should be friendlier.

1	2	3	4
---	---	---	---
4. The anesthesiologist doctor appeared to be under time pressure during the consultation.

1	2	3	4
---	---	---	---
5. The anesthesiologist doctor did not give enough information.

1	2	3	4
---	---	---	---
6. The information given was understandable.

1	2	3	4
---	---	---	---

PERIOPERATIVE:

7. Fear of anesthesia played an important role.

1	2	3	4
---	---	---	---
8. Fear of surgery played an important role.

1	2	3	4
---	---	---	---
9. The night before surgery felt relaxed.

1	2	3	4
---	---	---	---
10. The surgery was postponed for another day.

1	2	3	4
---	---	---	---
11. Prior to the procedure fear to the point of losing control was felt.

1	2	3	4
---	---	---	---
12. The waiting time on the day of the surgery was long.

1	2	3	4
---	---	---	---
13. The feeling of being left alone caused stress.

1	2	3	4
---	---	---	---
14. In general, fear or agitation played an important role in the period prior to anesthesia.

1	2	3	4
---	---	---	---
15. Thirst before the anesthesia was a problem.

1	2	3	4
---	---	---	---
16. Feeling cold or shivering was experienced in the room where the anesthesia was applied.

1	2	3	4
---	---	---	---
17. Pain prior to the anesthesia caused stress.

1	2	3	4
---	---	---	---
18. The anesthesia went exactly as the doctor had advised.

1	2	3	4
---	---	---	---

19. The atmosphere was pleasant in the anesthesia room.

1	2	3	4
---	---	---	---
20. Staff members took good care of me, and were responsive while anesthesia was applied.

1	2	3	4
---	---	---	---

POST-ANESTHETIC RECOVERY

21. Waking up from anesthesia was comfortable.

1	2	3	4
---	---	---	---
22. After waking up from anesthesia, pain was experienced in the area of surgery.

1	2	3	4
---	---	---	---
23. Little or no pain was experienced in other areas (e.g. the head) following the surgery.

1	2	3	4
---	---	---	---
24. Staff members showed they were seriously concerned about my pain.

1	2	3	4
---	---	---	---
25. The staff quickly alleviated my pain.

1	2	3	4
---	---	---	---
26. Nausea or vomiting was a problem following anesthesia.

1	2	3	4
---	---	---	---
27. Hoarseness or a sore throat was a problem following anesthesia.

1	2	3	4
---	---	---	---
28. Weakness of the muscles was a problem following anesthesia.

1	2	3	4
---	---	---	---
29. Thirst was a problem following anesthesia.

1	2	3	4
---	---	---	---
30. An urgent need to urinate was a problem following anesthesia.

1	2	3	4
---	---	---	---
31. Feeling cold or shivering were problems following the anesthesia.

1	2	3	4
---	---	---	---
32. It was hard to breathe following the anesthesia.

1	2	3	4
---	---	---	---
33. Fatigue or inability to concentrate was a problem after anesthesia.

1	2	3	4
---	---	---	---
34. Immediately after I woke from anesthesia, staff members were available and responsive to me.

1	2	3	4
---	---	---	---
35. Anesthesia staff in the recovery room were friendly.

1	2	3	4
---	---	---	---
36. The recovery following anesthesia went well.

1	2	3	4
---	---	---	---
37. You can trust the anesthesia staff.

1	2	3	4
---	---	---	---
38. You can be sure that the anesthesiologist was making decisions in the best interest of the patient.

1	2	3	4
---	---	---	---

Figure 1 Adapted from the Heidelberg Peri-anaesthetic Questionnaire.

versa, and a score of 2 was converted to 3, and vice versa). These are questions 1, 3, 4, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 22, 26, 27, 28, 29, 30, 31, 32 and 33: they are marked with an “X” in Figure 2. Questions with a mean score of satisfaction below the overall mean minus 1 SD were selected for further evaluation as potential factors associated with dissatisfaction. Below, where convenient, we refer to the questions by their numbers, e.g., “Q7”, “Q8”.

Multivariate logistic regression analysis was used to identify the variables associated with dissatisfaction in the selected questions. Dissatisfaction was defined as a score of 1 (strongly disagree) or 2 (disagree).

All the tests were two-tailed, and final results with $p \leq 0.05$ were considered statistically significant. The data were analyzed using the Statistical Package for Social Sciences software (version 20.0, SPSS, Chicago, IL, USA) and registered on a Microsoft Excel database (version 16.47.1). We followed STROBE guidelines to report this trial.

Results

The variables studied, together with the respective results, are shown in Table 1. Only 8 (0.66%) patients refused to answer all the questions. Questions with mean satisfaction minus 1 SD are shown below in Figure 2.

Questions 24 and 25, which were below mean satisfaction minus 1 SD (3.70 to 0.63), are shown in Tables 2 and 3, respectively.

In Question 24, compared to female patients, male patients had a 2.11 times higher tendency toward dissatisfaction in this question (95% CI 0.995–4.475, $p = 0.051$). This means that men more often felt that staff members were not seriously concerned about their pain. Patients who had undergone prior general anesthesia were more likely to show dissatisfaction, with an Odds Ratio (OR) of 1.68

Table 1 Data on patient characterization, anesthesia, and surgery by specialty (n = 1211).

Variables	Values
Age (mean ± standard error)	44.8 ± 15.4
Female	990 (81.8)
Education	
Illiterate or incomplete primary	9 (0.8)
Complete elementary	23 (1.9)
Complete high school	286 (24.0)
Incomplete or complete college	876 (73.4)
Prior anesthesia	
General	675 (55.7)
Spinal block	569 (47.0)
Local and sedation	252 (20.8)
Peripheral block	4 (0.3)
ASA	
I	553 (45.7)
II	644 (53.3)
III	12 (1.0)
Type of anesthesia	
General	995 (82.2)
Local and sedation	161 (13.3)
Peripheral block	53 (4.4)
Spinal block	2 (0.2)
Anesthesia time (min) (median and quartiles)	50 (45–75)
Surgical specialty	
(1) Gynecological	551 (45.5%)
(2) Vascular	207 (17.1%)
(3) Dermatological	101 (8.3%)
(4) Ophthalmic	99 (8.2%)
(5) Orthopedic	125 (10.3%)
(6) Urological	51 (4.2%)
(*) Other	77 (6.4%)

The data are presented as valid n (%), unless specified.

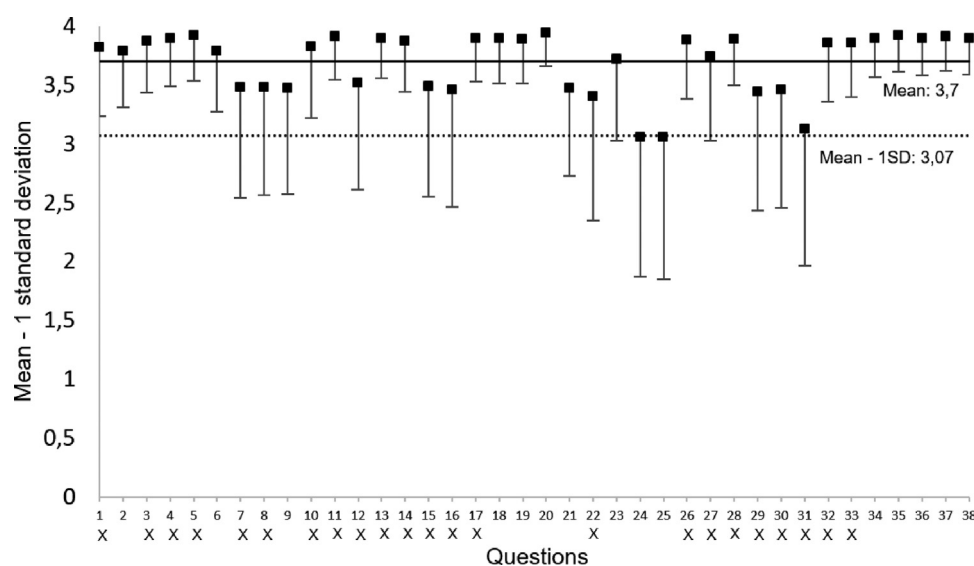


Figure 2 Mean – 1 standard deviation of satisfaction scores for each item. Mean satisfaction scores were calculated for each question. Questions that were asked in the negative nature are marked with an “X”. Questions below the satisfaction average are represented in Tables 2 and 3. Questions with a high internal SD are analyzed in Table 4.

Table 2 Q24: “Staff members showed they were seriously concerned about my pain”.

	Coefficient	SE	Wald	OR	CI 95%	p-value
Age (each additional year)	-0.004	0.010	0.178	0.996	0.976–1.016	0.673
Male	0.747	0.384	3.792	2.110	0.995–4.475	0.051
Education (ref.: Complete college)			2.703			0.259
Complete elementary	0.799	0.604	1.748	2.223	0.680–7.269	0.186
Complete high school	0.333	0.286	1.356	1.395	0.797–2.443	0.244
ASA (ref.: ASA I)			0.032			0.984
ASA II	0.045	0.257	0.031	1.046	0.632–1.731	0.860
ASA III	0.075	1.058	0.005	1.078	0.135–8.583	0.943
Anesthesia Type (ref.: General)			0.551			0.759
Local and sedation	-0.328	0.732	0.200	0.721	0.172–3.027	0.655
Peripheral block	0.405	0.736	0.302	1.499	0.354–6.343	0.582
Total anesthesia time (minutes)	-0.009	0.005	3.034	0.991	0.981–1.001	0.082
Prior anesthesia						
General	0.518	0.261	3.943	1.678	1.007–2.796	0.047
Local and sedation	-0.107	0.309	0.120	0.899	0.491–1.646	0.729
Spinal block	-0.065	0.265	0.060	0.937	0.557–1.576	0.806
Surgical specialty			19.705			0.003
(1) Gynecological	-0.622	0.352	3.126	0.537	0.269–1.070	0.077
(2) Vascular	0.303	0.359	0.710	1.354	0.669–2.737	0.399
(3) Dermatological	1.173	0.652	3.231	3.231	0.899–11.604	0.072
(4) Ophthalmic	-1.700	0.928	3.358	0.183	0.030–1.125	0.067
(5) Orthopedic	0.146	0.460	0.101	1.157	0.470–2.850	0.751
(6) Urological	1.217	0.533	5.203	3.376	1.187–9.603	0.023

SE, Standard Error; OR, Odds Ratio; CI, Confidence Interval.

Table 3 Q25: “The staff quickly alleviated my pain”.

	Coefficient	SE	Wald	OR	95% CI	p-value
Age (each additional year)	-0.013	0.011	1.548	0.987	0.967–1.008	0.213
Male	0.782	0.402	3.793	2.187	0.995–4.806	0.051
Education (ref.: Complete college)			2.276			0.320
Complete elementary	0.592	0.644	0.844	1.807	0.511–6.391	0.358
Complete high school	0.379	0.287	1.742	1.460	0.832–2.562	0.187
ASA (ref.: ASA I)			0.189			0.910
ASA II	-0.087	0.261	0.111	0.917	0.549–1.530	0.739
ASA III	0.214	1.030	0.043	1.239	0.165–9.329	0.835
Anesthesia type (ref.: General)			1.305			0.521
Local and sedation	-0.615	0.860	0.511	0.541	0.100–2.918	0.475
Peripheral block	0.717	0.832	0.744	2.049	0.402–10.455	0.388
Total anesthesia time (minutes)	-0.006	0.005	1.376	0.994	0.985–1.004	0.241
Prior anesthesia						
General	0.616	0.266	5.354	1.852	1.099–3.122	0.021
Local and sedation	-0.057	0.311	0.033	0.945	0.513–1.739	0.855
Spinal block	-0.181	0.271	0.448	0.834	0.491–1.418	0.503
Surgical specialty			17.954			0.006
(1) Gynecological	-0.684	0.353	3.750	0.504	0.252–1.008	0.053
(2) Vascular	0.129	0.372	0.120	1.138	0.548–2.360	0.729
(3) Dermatological	1.554	0.766	4.119	4.733	1.055–21.236	0.042
(4) Ophthalmic	-1.503	0.943	2.542	0.222	0.035–1.411	0.111
(5) Orthopedic	0.049	0.484	0.010	1.050	0.406–2.714	0.919
(6) Urological	1.089	0.543	4.030	2.973	1.026–8.611	0.045

SE, Standard Error; OR, Odds Ratio; CI, Confidence Interval.

(95% CI 1.01–2.80, $p = 0.047$). In the multivariate analysis of question 24, patients who had undergone urological surgery (category 6) had a higher chance of dissatisfaction, compared to the mean general dissatisfaction value, with an OR of 3.38 (95% CI 1.19–9.60, $p = 0.023$). Patients who underwent dermatological surgery (category 3) also showed a tendency toward increased chance of dissatisfaction, with an OR of 3.23 (95% CI 0.90–11.60, $p = 0.72$), compared to the mean general dissatisfaction value. Patients who had undergone gynecological surgery (category 1) and ophthalmologic surgery (category 4) showed a tendency toward a decreased chance of dissatisfaction in relation to concern of the staff with patient pain, with ORs of 0.54 (95% CI 0.27–1.07, $p = 0.77$) and 0.18 (95% CI 0.30–1.13, $p = 0.67$), respectively.

The likelihood of dissatisfaction with the speed with which members of the anesthesia team relieved the patient's pain was higher in patients with a prior history of general anesthesia (OR = 1.85, 95% CI 1.09–3.12, $p = 0.021$) and tended to be higher among men (OR = 2.19, 95% CI 0.995–4.80, $p = 0.051$). Thus, being male and having a history of prior general anesthesia were factors associated with dissatisfaction in this question (i.e., negative response to the question "The staff quickly alleviated my pain").

Patients who underwent dermatological surgery (category 3) and urological surgery (category 6) were more likely to be dissatisfied with the speed of team members in easing their pain, with ORs of 4.73 (95% CI 1.055–21.236, $p = 0.42$) and (OR = 2.97, 95% CI 1.30–8.61, $p = 0.45$), respectively. Patients undergoing gynecological surgery (category 1) showed a tendency toward decreased chance of dissatisfaction with the speed of team members in easing their pain, with an OR of 0.50 (95% CI 0.25–1.01, $p = 0.053$).

We noted that a relatively high number of patients did not respond to questions 24 (59.6%) and 25 (62.8%) due to the condition established in the question, which was having felt postoperative pain.

In our study, advanced age and prior experience of general anesthesia were correlated with patients being less afraid of undergoing further anesthesia (Q7), and older patients were also found to be less afraid of surgery (Q8). We conclude that in relation to fear, there is a need to improve care for patients who have never undergone anesthesia and for younger patients.

In relation to another question involving anxiety (Q9), specifically regarding the night before surgery (Q9), there was a tendency for older patients to be more relaxed, supporting the concept of eliminating the use of anxiolytics as premedication in the cases of some of these patients.

There were a few questions that had a higher satisfaction mean than the mean minus 1 SD, but with a high internal SD among the results, indicating a great deal of heterogeneity among the answers. Although a high mean was maintained, many individuals had poor experiences and were dissatisfied. The questions in which means were good but internal SDs were high are indicative of points in anesthetic care with the potential for improvement in terms of greater uniformity in care quality. These were questions Q7 (SD = 0.936), Q8 (SD = 0.918), Q9 (SD = 0.895), Q12 (SD = 0.906), Q15 (SD = 0.945), Q16 (SD = 0.998), Q21 (SD = 0.747), Q22 (SD = 1.051), Q29 (SD = 1.005), Q30 (SD = 1.004) and Q31 (1.169), as shown in [Table 4](#).

Discussion

In this study, using the Heidelberg Peri-anesthetic Questionnaire, patients tended to show dissatisfaction related to fear of anesthesia and surgery; feeling cold; urgent need to urinate; pain at the surgical site; and the level of the team's concern and speed of response in relieving their pain.

The questionnaire makes it possible to evaluate the quality of the peri-anesthetic care in an outpatient surgery unit, in the various stages of care in which the anesthetist is directly involved. This makes this tool more appropriate for an identification of dissatisfied patients than others widely cited in the literature, such as the QoR-40 questionnaire developed by Myles et al.¹⁰ and the QoR-15 questionnaire developed by Stark et al.¹⁶ in which evaluation is limited to the quality of post-anesthetic recovery.

In contrast to the original method developed by Schiff et al.¹⁴ in which the questionnaire was distributed to patients and data collected subsequently, we applied the questionnaire in the form of a standardized interview. We chose this method because patients undergoing ophthalmic surgery could not read the questionnaire in the immediate postoperative period and would therefore have been excluded from the study. We chose a team member to conduct all the interviews and, similarly to Bauer et al.²⁰ we achieved surprisingly high patient acceptance and questionnaire completion rates.

Our mean satisfaction results were high compared to other studies on the subject in the literature.^{14,17,20} Since patients tend to give positive answers to questions, the analysis gave priority to questions in which dissatisfaction was higher, irrespective of absolute values.

There was a tendency for older patients to feel less afraid of undergoing further anesthesia (Q7) and surgery (Q8), and to feel more relaxed the night before surgery (Q9). Celik et al.²¹ evaluated preoperative anxiety and fear of anesthesia at a university hospital using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) score and did not find a significant correlation between anxiety scores and age. They observed, though, that as patients get older, their desire for information decreases. Data in the literature on correlation between anxiety and advanced age are divergent.

The waiting time on the day of surgery (Q12) was an area in which younger patients and those undergoing dermatological surgery had a higher chance of dissatisfaction.

We also analyzed dissatisfaction with thirst before anesthesia (Q15). We found that older patients had a tendency to complain less of thirst before surgery. Patients with prior experience of local anesthesia and sedation were more likely to be dissatisfied, possibly due to prolonged preoperative fasting time. On waking from anesthesia, thirst (Q29) continued to be an important factor of dissatisfaction, and elderly patients, again, were least likely to complain. Patients with a high school education were less likely to complain of thirst than patients with a college degree. As the thirst sensation decreases with age,²² the elderly are more prone to dehydration; this group therefore requires special attention in this regard.

Feeling cold or shivering in the room where the patients were anesthetized (Q16) and after anesthesia (Q31) was a cause for dissatisfaction, especially among female patients,

Table 4 Variables associated with dissatisfaction in the questions analyzed.

	OR	95% CI	p-value
Q7. Fear of anesthesia played an important role.			
Age (each additional year)	0.990	0.978–1.003	0.082
Prior general anesthesia	0.751	0.544–1.035	0.080
Q8. Fear of surgery played an important role.			
Age (each additional year)	0.985	0.973–0.997	0.015
Q9. The night before surgery felt relaxed.			
Age (each additional year)	0.987	0.973–1.001	0.071
Q12. The waiting time on the day of the surgery was long			
Age (each additional year)	0.981	0.967–0.994	0.006
Dermatological surgery	1.769	1.091–2.867	0.021
Ophthalmic surgery	0.265	0.095–0.740	0.011
Q15. Thirst before the anesthesia was a problem.			
Age (each additional year)	0.986	0.975–0.999	0.028
Prior local and sedation anesthesia	1.446	1.008–2.078	0.045
Q16. Feeling cold or shivering was experienced in the room where the anesthesia was applied.			
Age (each additional year)	0.989	0.978–1.001	0.081
Male	0.592	0.380–0.922	0.020
Complete college	2.293	0.894–5.877	0.083
Q21. Waking up from anesthesia was comfortable.			
Male	0.477	0.226–1.004	0.051
Local anesthesia and sedation	0.312	0.078–1.246	0.099
Prior local and sedation anesthesia	1.575	1.009–2.457	0.046
Gynecological surgery	1.561	0.931–2.617	0.091
Dermatological surgery	0.227	0.055–0.946	0.042
Q22. After waking up from anesthesia, pain was experienced in the area of the surgery			
Age (each additional year)	0.998	0.976–1.001	0.075
Male	0.484	0.294–0.797	0.004
Complete high school	0.672	0.463–0.975	0.036
Spinal block	0.638	0.454–0.897	0.010
Gynecological surgery	3.010	1.907–4.750	0.000
Dermatological surgery	0.220	0.066–0.738	0.014
Ophthalmic surgery	0.354	0.132–0.952	0.040
Q29. Thirst was a problem following anesthesia.			
Age (each additional year)	0.988	0.976–1.000	0.046
Complete high school	0.707	0.493–1.013	0.059
Q30. An urgent need to urinate was a problem following anesthesia.			
Age (each additional year)	0.983	0.968–0.997	0.020
Female	0.432	0.236–0.791	0.007
Anesthesia time (every single minute)	1.011	1.005–1.016	0.000
Urological surgery	2.236	1.149–4.349	0.018
Gynecological surgery	1.443	0.951–2.191	0.085
Orthopedic surgery	0.472	0.219–1.017	0.055
Q31. Feeling cold or shivering were problems following the anesthesia.			
Age (each additional year)	0.980	0.968–0.991	0.001
Male	0.496	0.320–0.769	0.002
Anesthesia time (every single minute)	1.005	1.001–1.010	0.020
Ophthalmic surgery	0.582	0.321–1.058	0.076

SE, Standard Error; OR, Odds Ratio; CI, Confidence Interval.

and was directly related to duration of anesthesia. Older patients were less likely to be dissatisfied due to feeling cold before being anesthetized, likely because it is characteristic of advancing age to be less sensitive to variations in room

temperature.²³ We conclude that these patients should be given special attention in regard to prevention and treatment of perioperative hypothermia.²⁴ Compared to patients with a high school education, patients with a college

education had a greater tendency to be dissatisfied due to feeling cold in the operating room.

Regarding pain at the surgical site on waking from anesthesia (Q22),²⁵⁻²⁸ our results are similar to those found by Stark et al.¹⁶ and Gerbershagen et al.²⁵ in equivalent samples. It can be concluded that young, female patients, those with a college education and those undergoing gynecological surgery under general anesthesia had a greater chance of dissatisfaction due to pain at the surgical area.

The questions that addressed satisfaction with care in the case of postoperative pain (Q24 and Q25) were those for which the lowest mean satisfaction scores were found, and these mean scores were also lower than those found by Moura et al.¹⁷ We observed that the number of individuals who did not answer the two questions (Q24, 59.6% and Q25, 62.8%) was very high due to a characteristic of the method – since having felt pain in the postoperative period was a prerequisite for answering the question. Male patients were more likely to be dissatisfied than women. There was also a greater tendency toward dissatisfaction among patients who had undergone prior general anesthesia. Being male, having a history of prior general anesthesia and having undergone urological surgery were factors associated with dissatisfaction in response to these questions.

Elderly patients were less likely to experience an urgent need to urinate (Q30), which is expected, given that the sensation of having a full bladder decreases with advancing age.²⁹ Compared with male patients, female patients were more likely to feel an urgent need to urinate. It can be concluded that patients undergoing local anesthesia, sedation and spinal block were less likely to experience an urgent need to urinate than those who underwent general anesthesia. Moreover, the longer the duration of anesthesia, the greater was the likelihood of the patient experiencing an urgent need to urinate after surgery. This result is expected due to the longer period of hydration without the possibility of emptying the bladder.

There were significant correlations between higher satisfaction and older age and lower education level. Our results resemble those found in a meta-analysis performed by Hall et al.³⁰ where older patients were observed to generally report less pain, nausea, and vomiting, and were likely to score more positively in level of satisfaction.

Limitations of this study include the fact that it was carried out at a single hospital, and that the questionnaire was applied as an interview. The fact that the study was carried out in an autonomous outpatient surgery unit represented a limiting factor for the inclusion of surgical risk in the multivariate analysis. The high level of education of the studied population proved to be a possible limitation since it does not correspond to the average level of education of the population of the country (Brazil). The short period between the end of anesthesia and the interview may also have been a limiting factor, as these patients might still have been under the influence of drugs, and thus possibly with an altered mood, influencing their responses. A possible alternative to this problem would be to conduct a second interview, after hospital discharge. The fact that females were 81.8% of the population of this study could also have been a limiting factor since females may have different levels of satisfaction or dissatisfaction than males.

Conclusion

The Heidelberg Peri-anaesthetic Questionnaire proved to be a useful tool in identifying points of patient dissatisfaction, mainly fear of anesthesia and surgery, feeling cold, the urgent need to urinate, pain at the surgical site, and the team's level of concern and speed of response in relieving the patient's pain in the population studied. These were correlated with patient variables as age, sex, education level, ASA physical status, prior anesthesia, anesthesia type and duration and surgical specialty. This allows the establishment of priorities at the different points of care, with the ultimate goal of improving patient satisfaction in relation to anesthesia care.

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Conflicts of interest

The authors declare no conflicts of interest.

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