Comparison of the Effects of Short and Standard Forms for Preoperative Anesthetic Evaluation on Anesthesia Technique and Complications

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Abstract

Aim: Preoperative evaluation is essential for anesthesia planning and perioperative safety. However, the optimal extent of preoperative history-taking in low-risk patients remains debated. This study aimed to compare the effects of short- versus long-form preoperative history-taking on anesthesia management and perioperative complications in American Society of Anesthesiologists (ASA) I patients.

Methods: This prospective, randomized study included 750 ASA I adult patients undergoing elective surgery at a single tertiary care center. Participants were randomly assigned to either a short-form (5-question, n = 375) or a long-form (26-question, n = 375) questionnaire. The primary outcome was perioperative complication rates to assess the safety of the short form. Secondary outcomes evaluated whether questionnaire type influenced the duration of preoperative evaluation, number of consultation requests, and anesthesia techniques used.

Results: No significant differences were observed between groups in intraoperative complications (p = 0.70) or postoperative complications (p = 0.36). The mean duration of preoperative history-taking was significantly shorter in the short-form group (38.52 ± 7.99 seconds) than in the long-form group (103.17 ± 19.27 seconds; p < 0.001). Consultation requirements were identical (4 patients per group), and no significant differences were found in anesthesia techniques (p = 0.340).

Conclusions: In ASA I patients, a short-form preoperative questionnaire provides sufficient clinical information and significantly reduces preoperative evaluation time without increasing consultation requirements, altering anesthesia techniques, or affecting perioperative complication rates compared with a long-form questionnaire. These findings support the adoption of concise history-taking protocols in low-risk surgical candidates to improve clinical efficiency.

Keywords: *Preoperative evaluation; anesthesia; perioperative complications; history-taking duration; short-form questionnaire*

1. Introduction

Preoperative evaluation plays a fundamental role in modern anesthetic practice, providing a critical opportunity to assess and optimize the patient's overall condition before surgery. This process involves a comprehensive review of the medical history, a detailed physical examination, and the evaluation of relevant laboratory tests and imaging studies. The goal is to identify potential risks, reduce perioperative complications, and support the development of a personalized anesthetic plan tailored to each patient's needs.[1–5]

While structured anesthesia forms are widely used to promote a standardized approach to preoperative assessment, current literature offers limited evidence regarding their optimal design and clinical utility.[6,7] In particular, collecting a comprehensive medical history from all patients may prolong the evaluation process, decrease patient comfort, and increase anesthesiologists' workload. This concern is especially relevant in high-volume preoperative clinics, where process optimization has been shown to improve patient flow, reduce unnecessary testing, and enhance patient satisfaction.[8] Additionally, overly sensitive questionnaires may generate false-positive responses, leading to unnecessary diagnostic procedures and consultations, which can prolong hospital stays, elevate healthcare costs, and distract clinicians from pertinent clinical priorities.[9,10] These issues are particularly relevant in American Society of Anesthesiologists (ASA) physical status I patients undergoing elective surgery, where the likelihood of uncovering significant findings is minimal.[11,12] In such cases, a more concise and focused assessment strategy may provide a safer,

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more efficient alternative without compromising the quality of care.[8,13]

In high-volume tertiary care hospitals, where time and staffing are often constrained, enhanced efficiency in preoperative clinics has become increasingly crucial. Studies have demonstrated that preoperative assessment may account for up to 30% of total anesthesia time and approximately 9% of its overall cost.[14] Importantly, reducing evaluation time has been shown to increase both patient and provider satisfaction without compromising safety.[12,15] Accordingly, the implementation of concise, validated history forms may enhance workflow efficiency while maintaining clinical quality.

In this study, we aimed to determine whether a brief preoperative history-taking format is as safe and effective as a longer, more detailed version in healthy ASA I patients undergoing elective surgery. Specifically, we compared anesthesia techniques, intraoperative and postoperative complication rates, and the time required for evaluation between patients assessed using either a short (5-question) or long (26-question) interview. We hypothesized that the short form would be as safe and effective as the long form in ASA I patients. Our goal is to contribute to the optimization of preoperative practices and support the development of efficient, evidence-based assessment protocols for low-risk surgical candidates.

2. Materials and Methods

Study Design and Ethical Approval

This prospective, randomized study was conducted at the Anesthesiology and Reanimation Department of Çukurova University Faculty of Medicine between January 1, 2013, and September 30, 2013. Institutional approval was obtained from the university's Clinical Research Ethics Committee. Written informed consent was obtained from all participants.

Patient Population

Patients were initially screened in the preoperative evaluation clinic by a nurse for ASA physical status. During the study period, 800 adult ASA I patients were screened and randomized. Patients were randomly allocated into two groups of equal size (n = 400 each) using a computer-generated randomization list. Subsequently, 50 patients were excluded from the final analysis because of incomplete data. Finally, 750 ASA I patients were included in the study (n = 375 per group). Surgical procedures from the departments of general surgery, gynecology, plastic and reconstructive surgery, and orthopedics were included. Inclusion criteria were age between 18 and 70 years, ASA I classification, and the ability to cooperate during preoperative evaluation. Patients with known systemic diseases, ASA ≥ II status, emergency surgeries, or language barriers were excluded.

Table 1

Structured short-form preoperative questionnaire (Group I)

No	Question
1	Do you take any medications regularly?
2	Have you undergone any surgery before? Please specify the name and date.
3	Have you ever had any major systemic disease (e.g., heart, liver, kidney)?
4	Do you have any known drug or substance allergies?
5	Do you consume alcohol, tobacco, or any illicit drugs?

Preoperative Assessment

All patients underwent routine preoperative evaluation in the anesthesiology outpatient clinic. Group I patients were evaluated using a brief standardized form consisting of five core questions targeting general medical condition (Table 1). This short-form questionnaire was developed based on the consensus of academic staff in our department. Group II patients were assessed using a comprehensive form composed of 26 structured questions encompassing detailed personal and family medical history, prior surgeries, and a systematic review (Table 2). This long-form questionnaire had been previously developed in our clinic and was similar in structure to those commonly used in other institutions.

Table 2

Long-form preoperative questionnaire (Group II)

Question	
1-Has a recent history of medical treatment?	14-Has liver disease?
2-Take any daily medication?	15-Has a metabolic disease? (Diabetes mellitus, gout, etc.)
3-Ever underwent surgery?	16-Any thyroid problem?
4-Had any severe reaction to anesthesia?	17-Any eye disease?
5-Had any history of blood transfusion?	18-Has a history of neuropsychiatric problem?
6-Any reaction to transfusion?	19-Musculoskeletal system disease?
7-Had radiotherapy?	20-Blood or hemorrhage disorder?
8-Had chemotherapy?	21-Any food or drug allergy?
9-Has a heart disease/failure?	22-Any extra complaints/disorder not mentioned above?
10-Circulatory or peripheral vascular disease?	23-Use of dental plate?
11-Has a lung or respiratory system disease?	24-Smoking history?
12-Liver disease?	25-Alcohol usage?
13-Has a gastrointestinal disease?	26-Recreational drugs

The preoperative evaluation forms were completed by the responsible anesthesia resident through direct patient interviews. The duration required to complete the respective preoperative evaluation forms was measured using a stopwatch, starting from the beginning of the questionnaire until the documentation was fully completed. Any additional preoperative consultations requested, or changes in anesthetic planning based on history were noted and recorded for each patient.

The same group of residents performed evaluations in both study arms according to the randomization list. Blinding of the evaluating residents was not feasible due to the obvious difference in questionnaire length; however, intraoperative and postoperative data were recorded by clinicians who were not involved in the preoperative assessment process.

Intraoperative Period

In all cases taken to the operating room, non-invasive blood pressure (NIBP), electrocardiography (ECG), heart rate (HR), and peripheral oxygen saturation (SpO_2) were continuously monitored.

The patients' systolic arterial pressure (SAP), diastolic arterial pressure (DAP), mean arterial pressure (MAP), heart rate (HR), and peripheral oxygen saturation (SpO_2) values were recorded preoperatively and intraoperatively at 5, 15, 30, 45, 60, 75, 90, 120, 150, and 180 minutes based on the duration of surgery.

Depending on the choice of general or regional anesthesia or sedoanalgesia, a pre-defined standard protocol was applied accordingly. For general anesthesia induction, 3–5 mg/kg thiopental and 0.6 mg/kg rocuronium were administered for neuromuscular blockade. Anesthesia maintenance was achieved using 6% desflurane in a mixture of 66% nitrous oxide and 33% oxygen. For regional anesthesia, spinal anesthesia was performed in all patients using an intrathecal combination of 12–15 mg of 0.5% bupivacaine and 25 µg of fentanyl. In sedoanalgesia, various combinations of 0.03–0.06 mg/kg midazolam, 0.5 µg/kg fentanyl, and 0.5 mg/kg ketamine were administered intravenously.

Postoperative Period

All patients whose surgeries were completed were transferred to the postoperative recovery unit while awake and with adequate spontaneous respiration. All patients were monitored for 60 minutes, during this period, patients were closely observed for vital signs and potential complications, including pain (visual analog scale [VAS] > 4), hypotension, hypertension, nausea, vomiting, bradycardia, tachycardia, and respiratory depression.

Patients were transferred to their respective wards once they met the discharge criteria from the postoperative care unit, which included the ability to respond to verbal commands, stable hemodynamic and respiratory parameters (SAP, DAP, HR, and SpO_2), pain scores below 4 on the VAS, normal body temperature, and absence of complications such as nausea or vomiting. The same parameters were recorded and monitored in the ward at postoperative 2nd, 6th, 12th, and 24th hours.

Study Outcomes

The primary outcome of the study was the incidence of perioperative complications in order to evaluate the safety of the short-form preoperative assessment compared with the long-form assessment. Intraoperative complications included hypoxia (SpO_2 < 90%), hypotension (SAP < 90 mmHg), hypertension (SAP > 130 mmHg), bradycardia (HR < 50 bpm), and tachycardia (HR > 120 bpm). Postoperative complications included pain (VAS > 4), hemodynamic instability, nausea, vomiting, and respiratory depression within the first 24 hours. Any other complication occurring during the perioperative period was also recorded.

Secondary outcomes included the duration of preoperative evaluation, the number of additional specialty consultations requested, and any changes in the initially planned anesthetic technique.

Table 3

Demographics

Variable	Group 1	Group 2	P-Value
Age	45 (19 – 70) *	45 (19- 68) *	p=0.164
Female	208 (55.5%) **	181 (48.3%) **	p=0.057
Male	167 (44.5%) **	194 (51.7%) **	p=0.068

** Median (Min-Max), **n (%)*

Statistical Analysis

All statistical analyses were performed using SPSS version 15.0 (IBM Corp., Armonk, NY, USA). Continuous variables were tested for normality using the Shapiro-Wilk test. Normally distributed variables were compared using independent samples t-tests, while non-normally distributed data were analyzed using the Mann-Whitney U test. Categorical variables were analyzed with Pearson's chi-square or Fisher's exact test as appropriate. Results were presented as mean ± standard deviation (SD), median (interquartile range), or frequencies (%). A p-value < 0.05 was considered statistically significant.

A priori sample size calculation was performed for the primary outcome (perioperative complications). Assuming a perioperative complication rate of approximately 3% in ASA I patients and a clinically meaningful absolute difference of 5% between groups, 356 patients per group were required to achieve 80% power at a two-sided alpha level of 0.05. To compensate for potential missing or incomplete data, 400 patients per group were initially planned. Ultimately, 375 patients were included in each group.

3. Results

Patient Characteristics

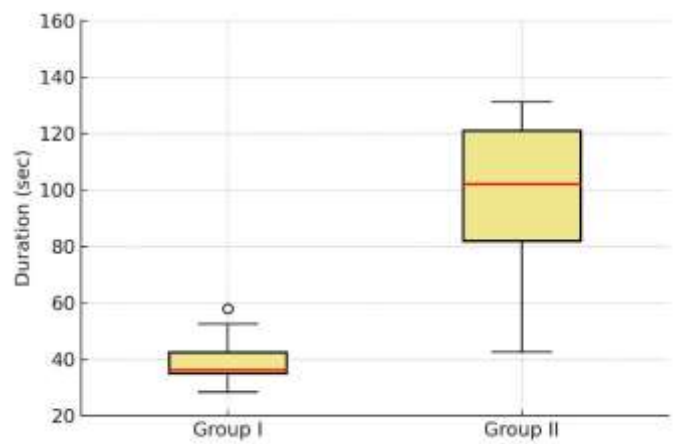
A total of 800 patients were screened in the preoperative evaluation clinic during the study period. Of these, 50 patients were excluded due to incomplete data. Finally, 750 patients (n = 375 in each group) were included in the final analysis. The groups were statistically comparable in terms of demographic characteristics, including age and sex (p > 0.05) (Table 3).

Preoperative Evaluation Time and Consultation Needs

The mean duration of the preoperative interview was significantly shorter in the short-form group than in the long-form group (38.52 ± 7.99 seconds vs. 103.17 ± 19.27 seconds; p < 0.001) (Figure 1). During the preoperative evaluation, consultation was required for 4 patients in both groups, and there was no difference between the groups in terms of the need for consultation. No surgery cancellations or procedure delays were observed in the study cohort.

Figure 1

Comparison of preoperative interview durations between the short-form and long-form groups



Distribution of Anesthesia Techniques

No statistically significant differences were found between the groups in terms of the anesthesia techniques employed (p > 0.05) (Table 4).

Table 4

Type of anesthesia administered

Anesthesia Type	Group 1	Group 2	Total	p-Value
General Anesthesia	333 (88.8%)	332 (88.5%)	665 (88.7%)	p=0.77
Spinal Anesthesia	35 (9.3%)	30 (8.0%)	65 (8.7%)	p=0.67
Sedoanalgesia	7 (1.9%)	13 (3.5%)	20 (2.7%)	p=0.07

The data are expressed as absolute numbers and percentages of patients in each group.

Figure 2

Comparison of intraoperative and postoperative complications between the short-form and long-form groups

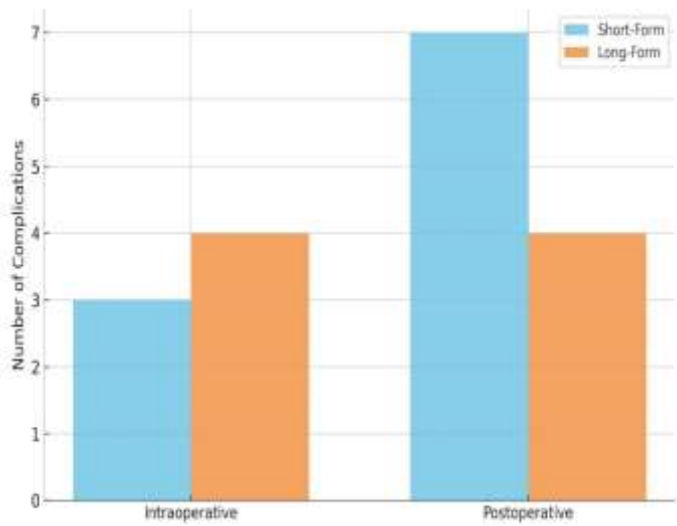


Table 5

Intraoperative complications observed in the study

Intraoperative Complication	Group 1	Group 2	p-Value
Bradycardia	0 (0.0%)	1 (0.3%)	p=0.48
Tachycardia	1 (0.3%)	1 (0.3%)	p>0.999
Hypotension	2 (0.5%)	2 (0.5%)	p>0.999
Hypertension	0 (0.0%)	0 (0.0%)	p>0.999

The data are expressed as absolute numbers and percentages of patients in each group.

Intraoperative and Postoperative Complications

No significant differences were observed between the two groups regarding intraoperative or postoperative complications ($p > 0.05$ for all comparisons) (Figure 2).

Intraoperative and postoperative complications observed in both groups are summarized in Tables 5 and 6, respectively. There were no statistically significant differences between the short- and long-form questionnaire groups in terms of intraoperative ($p = 0.70$) or postoperative complications ($p = 0.36$).

4. Discussion

This study evaluated whether a short-form preoperative history-taking strategy is as safe and clinically effective as a standard long-form questionnaire in ASA I patients undergoing elective surgery. The principal finding is that perioperative complication rates did not differ between the two groups, indicating that a simplified five-question assessment provides a safety profile comparable to that of a more extensive 26-question form in low-risk patients. This finding supports the concept that, in ASA I healthy individuals, focused history-taking may be sufficient to ensure safe anesthetic management.

Table 6

Postoperative Complications Observed in the Study

Postoperative Complication	Group 1	Group 2	p-Value
Tachycardia	2 (0.5%)	0 (0.0%)	p=0.31
Hypertension	0 (0.0%)	1 (0.3%)	p=0.48
Nausea	2 (0.5%)	2 (0.5%)	p>0.999
Pain	3 (0.8%)	1 (0.3%)	p=0.37

The data are expressed as absolute numbers and percentages of patients in each group.

Consistent with the primary outcome, no differences were observed between groups with respect to intraoperative hemodynamic instability, respiratory events, or postoperative complications such as nausea, vomiting, or uncontrolled pain. Furthermore, anesthesia technique selection and consultation requirements were similar in both groups. These findings are consistent with previous literature indicating that more extensive preoperative questioning does not necessarily modify anesthetic decision-making in low-risk populations.[16] The low overall incidence of complications in both groups reflects the expected baseline risk in ASA I patients; however, it should be acknowledged that this low event rate may limit the ability to detect small between-group differences.

A key finding of the present study was the significant reduction in evaluation time in the short-form group compared to the long-form group. The mean interview duration was approximately 65 seconds shorter in the short-form group. Although this difference appears modest at the individual level, its cumulative effect in high-volume preoperative clinics is considerable. In institutions where dozens or even hundreds of patients are evaluated daily, this time savings may translate into several hours of additional clinical capacity. Prior studies have emphasized the operational burden faced by anesthesiology outpatient services, particularly in tertiary and training hospitals.[17,18] In this context, the implementation of concise and structured assessment tools has been proposed as a strategy to improve efficiency without compromising clinical quality. Moreover, reducing waiting and interview times has been associated with improved patient comfort, lower anxiety levels, and greater overall satisfaction.[19]

From a systems-level perspective, our findings have important implications for workflow optimization in anesthesiology services. As elective surgical volumes continue to increase globally,

preoperative clinics are under growing pressure to streamline processes without compromising patient safety. The adoption of short-form preoperative assessment tools has the potential to reduce outpatient clinic congestion, shorten waiting times, and improve overall patient flow—factors that are closely associated with higher patient satisfaction and better perceived quality of care. Moreover, reducing the time required for routine assessments in low-risk patients enables anesthesiologists to allocate greater time and cognitive resources to individuals with complex comorbidities or higher perioperative risk, thereby enhancing the overall quality and safety of perioperative care. From an economic standpoint, shorter evaluation times and fewer unnecessary investigations or consultations may translate into lower operational costs and more efficient utilization of hospital resources. Consistent with this perspective, previous process optimization studies in perioperative care have shown that targeted interventions, including preoperative planning and standardization of resources, can decrease resource utilization while maintaining comparable clinical outcomes.[20] Collectively, our findings support the integration of short-form preoperative assessments as a pragmatic strategy that preserves clinical rigor while promoting operational efficiency.

However, some limitations must be acknowledged. First, this was a single-center study, which may limit the generalizability of the findings to other institutions with different patient populations and clinical workflows. Second, the study population was limited to ASA I patients undergoing elective surgery, and therefore the results may not be applicable to higher-risk patient groups. Third, the study included four different surgical categories rather than a single homogeneous surgical population, which may have introduced heterogeneity in perioperative management. Future multicenter studies involving more diverse patient populations and specific surgical cohorts are warranted to validate these findings.

5. Conclusion

In light of our findings, in ASA I patients, the short-form questionnaire appears to provide sufficient clinical information while significantly reducing the duration of preoperative evaluation. Compared with the long-form questionnaire, it is equally safe and does not affect anesthesia technique selection, consultation requirements, or perioperative morbidity. These results support the integration of concise assessment tools into routine preoperative practice, particularly in high-volume settings where workflow efficiency and resource optimization are critical. The short-form approach may also be well suited for digital implementation within electronic health record systems or pre-visit screening platforms, facilitating standardized, efficient, and scalable preoperative assessment models. Future studies should explore its applicability in higher-risk populations (e.g., ASA II–III patients) and further evaluate its impact in multicenter and digitally integrated settings.

Statement of ethics

The study was approved by the Ethics Committee of Çukurova University Faculty of Medicine (Approval No: 2012/09-14) and conducted in accordance with the Declaration of Helsinki.

genAI

No artificial intelligence-based tools or generative AI technologies were used in this study. The entire content of the manuscript was originally prepared, reviewed, and approved by both authors.

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Conflict of interest statement

The authors declare that they have no conflict of interest.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author contributions

HU and MO conceptualized the study and contributed to the design. USC performed the literature search. USC and UK were responsible for data collection and processing. HU and USC contributed to the analysis and interpretation of the data. HU and USC drafted the manuscript. All authors read and approved the final version of the manuscript.

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