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Research Article

Assessment of Awareness Regarding Anaesthesia-Related Complications in Diabetic Patients Undergoing Ophthalmic Procedures

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ABSTRACT

Background: Diabetic patients undergoing ophthalmic procedures represent a high-risk group due to the increased incidence of perioperative complications, including cardiovascular instability, delayed wound healing, and hypoglycaemia. Patient awareness is a crucial yet often overlooked factor in mitigating these risks. This study aims to assess the level of awareness regarding anaesthesia-related complications in diabetic patients scheduled for ophthalmic surgery.
Methods: A cross-sectional, observational study was conducted over a period of six months at a department of ophthalmology, tertiary care teaching hospital. A total of 80 diabetic patients (Type 1 or Type 2) scheduled for elective ophthalmic procedures under anaesthesia were enrolled. Data were collected using a structured, pre-validated questionnaire assessing demographic details, diabetic history, and awareness of potential anaesthesia-related complications. Awareness scores were categorized as good (>75%), fair (50-75%), and poor (<50%).
Results: The mean age of participants was 62.4 ± 8.7 years. The majority (68.8%) had Type 2 diabetes, with a mean duration of diabetes of 9.2 ± 5.1 years. Cataract surgery (77.5%) was the most common procedure. Overall, 61.3% of patients demonstrated poor awareness regarding anaesthesia-related complications. Specific gaps in knowledge were identified: 71.3% were unaware of the risk of perioperative hypoglycaemia, 65% were unaware of cardiovascular risks associated with anaesthesia in diabetics, and 58.8% did not understand the importance of preoperative blood glucose control. A statistically significant positive correlation was found between higher education levels and better awareness scores ($p < 0.05$).
Conclusion: The level of awareness regarding anaesthesia-related complications among diabetic patients undergoing ophthalmic procedures is alarmingly low. This lack of awareness represents a significant barrier to patient safety and shared decision-making. Implementing structured, pre-anaesthetic educational interventions is essential to improve patient outcomes in this vulnerable population.

Keywords: *Diabetes Mellitus, Anaesthesia, Ophthalmic Procedures, Patient Awareness, Perioperative Complications.*

INTRODUCTION

Diabetes mellitus (DM) has emerged as one of the most significant global health challenges of the 21st century. According to the International Diabetes Federation, approximately 537 million adults were living with diabetes in 2021, a number projected to rise to 783 million by 2045 [1]. This epidemic has profound implications for surgical services, as diabetic patients are more likely to require surgical interventions due to the complications of their disease. Among the most common surgical procedures performed on this population are ophthalmic surgeries, driven by conditions such as diabetic retinopathy, cataract formation (which occurs earlier and progresses more rapidly in diabetics), and glaucoma [2]. Consequently, anaesthesiologists and ophthalmologists are increasingly encountering a growing cohort of diabetic patients presenting for elective and emergency eye procedures.

Ophthalmic procedures encompass a wide spectrum of surgical interventions, from minimally invasive cataract extraction under topical anaesthesia to complex vitreoretinal surgeries requiring general anaesthesia. While these procedures are often

perceived as "minor" surgeries, the anaesthetic management of diabetic patients undergoing them is fraught with complexities. The presence of diabetes mellitus significantly alters the patient's physiological reserve and response to anaesthetic agents. The pathophysiology of diabetes involves chronic hyperglycaemia, microvascular and macrovascular complications, and autonomic neuropathy, all of which contribute to an elevated perioperative risk profile [3].

One of the primary concerns in this population is cardiovascular instability. Diabetic patients have a two-to four-fold increased risk of coronary artery disease, often with silent ischaemia due to autonomic neuropathy [4]. Anaesthetic agents, whether local, regional, or general, can precipitate profound haemodynamic fluctuations. For instance, the administration of local anaesthetics with epinephrine for peribulbar or retrobulbar blocks can lead to systemic absorption and cardiovascular effects, while general anaesthesia can unmask underlying cardiac dysfunction [5]. Furthermore, the stress response to surgery triggers the release of counter-regulatory hormones such as cortisol and catecholamines, which can induce significant hyperglycaemia, thereby increasing the risk of osmotic diuresis, dehydration, electrolyte imbalances, and postoperative infections [6].

Conversely, the perioperative fasting period, combined with the administration of insulin or oral hypoglycaemic agents, poses a substantial risk of hypoglycaemia. Intraoperative and postoperative hypoglycaemia is particularly dangerous in the ophthalmic setting, as it can present with subtle symptoms such as confusion or visual disturbances, which may be difficult to distinguish from the effects of sedation or the surgical procedure itself. Severe hypoglycaemia can lead to permanent neurological damage or cardiac arrhythmias [7]. Additionally, diabetic patients are at an increased risk of delayed wound healing, surgical site infections (including devastating conditions such as endophthalmitis), and prolonged hospital stays [8].

In the context of these heightened risks, patient awareness becomes a critical component of perioperative safety. The paradigm of modern healthcare has shifted towards patient-centred care, wherein informed, engaged patients are recognized as active partners in their own care. The process of informed consent for anaesthesia extends beyond a signature on a form; it requires that patients genuinely comprehend the specific risks associated with their medical condition and the proposed anaesthetic technique [9]. A patient who is aware of the importance of strict preoperative glycaemic control is more likely to adhere to fasting guidelines and medication adjustments. A patient who understands the signs of hypoglycaemia is better equipped to alert healthcare providers postoperatively, potentially averting a critical event.

Despite the recognized importance of patient education, there is a notable gap in the literature regarding the baseline level of awareness among diabetic patients undergoing ophthalmic procedures. Existing studies have focused primarily on anaesthetic techniques or clinical outcomes, with little attention paid to what patients actually know about their risks. This oversight is significant, as a lack of awareness can lead to non-adherence, delayed recognition of complications, and a breakdown in the shared decision-making process that underpins safe anaesthesia care [10].

In our clinical practice, we observed that many diabetic patients presenting for ophthalmic surgery appeared to have a limited understanding of how their diabetes could interact with anaesthesia to produce complications. This observation prompted us to systematically investigate this issue. Therefore, the primary objective of this study was to assess the level of awareness regarding anaesthesia-related complications in diabetic patients undergoing ophthalmic procedures. The secondary objectives were to identify specific knowledge gaps and to determine the demographic and clinical factors associated with better or poorer awareness. We hypothesized that the overall level of awareness would be suboptimal, particularly among patients with lower educational attainment and those with a shorter duration of diabetes, who may not have had extensive prior interactions with the healthcare system.

By quantifying this awareness gap, this study aims to provide evidence to support the development of targeted preoperative educational interventions. Enhancing patient awareness is not merely an educational exercise; it is a fundamental patient safety strategy that has the potential to reduce the incidence of preventable anaesthesia-related complications and improve overall surgical outcomes in this high-risk population.

MATERIALS AND METHODS

Research Design, setting & population

This study employed a hospital-based, cross-sectional, observational design. The study was conducted in the outpatient department of ophthalmology at a tertiary care teaching hospital. The target population for this study comprised all adult patients with a confirmed diagnosis of diabetes mellitus who were scheduled to undergo elective ophthalmic surgical procedures under any form of anaesthesia. The accessible population was diabetic patients presenting to the pre-anaesthetic evaluation clinic and ophthalmology outpatient department of the selected tertiary care hospital during the six-month study period.

Inclusion Criteria:

1. Patients aged 18 years or older.
2. Confirmed diagnosis of diabetes mellitus (Type 1 or Type 2) for a minimum duration of one year, based on medical records or patient history corroborated by prescribing history.

3. Scheduled for elective ophthalmic surgery (e.g., cataract extraction, glaucoma surgery, vitrectomy, corneal transplant) under any type of anaesthesia (topical, local, regional, or general).
4. Willing to provide written informed consent to participate in the study.

Exclusion Criteria:
1. Patients with a known history of cognitive impairment, dementia, or any major psychiatric illness that would impair their ability to understand and accurately respond to the questionnaire.
2. Patients who were illiterate and unable to understand the questionnaire even with the assistance of the interviewer (to ensure consistency in data collection).
3. Patients presenting for emergency ophthalmic procedures, as the urgency of the situation would preclude a comprehensive baseline awareness assessment.
4. Patients who had previously received formal anaesthesia education or participated in a structured patient education program related to diabetes and anaesthesia, as this would bias the assessment of baseline awareness.

Procedure for Data Collection

Data collection was conducted over a period of six months from January 2024 to June 2024. The following stepwise procedure was followed:
1. **Participant Identification:** All patients scheduled for elective ophthalmic surgery were screened from the surgical lists of the Department of Ophthalmology. Patients with a documented diagnosis of diabetes mellitus were identified.
2. **Approach and Recruitment:** Eligible patients were approached during their visit to the pre-anaesthetic evaluation clinic, *prior* to their formal consultation with the anaesthesiologist. This timing was crucial to ensure that the data reflected the patient's baseline awareness before any counselling from the anaesthesia team could influence their responses. The purpose of the study was explained to the patient, and written informed consent was obtained.
3. **Interviewer-Administered Questionnaire:** A trained research assistant, who was not part of the clinical anaesthesia team, administered the structured questionnaire in a private room to ensure confidentiality and minimize distractions. The questionnaire was read out to the participant in their preferred language (English or the local regional language), and their responses were recorded. This method was chosen to mitigate any literacy-related biases.
4. **Data Recording:** Demographic and clinical data (Part A) were collected from the patient's medical records and direct questioning. The knowledge assessment (Part B) was then completed, with the research assistant carefully reading each question and recording the participant's answer without providing any hints or corrective feedback. The source of information (Part C) was recorded at the end.
5. **Post-Collection Protocol:** Upon completion of the questionnaire, the patient proceeded with their scheduled pre-anaesthetic consultation. No changes were made to their clinical management based on their questionnaire responses. Data were anonymized by assigning a unique participant code to each questionnaire.

Data Analysis

The cleaned and coded data were transferred to IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA) for analysis. Frequency distributions and percentages were calculated for categorical variables. For continuous variables (e.g., age, duration of diabetes), mean and standard deviation (SD) were computed. The Chi-square test (or Fisher's exact test where expected cell frequencies were less than 5) was used to assess the association between independent categorical variables (e.g., educational status, type of diabetes) and the outcome variable (level of awareness). A p-value of < 0.05 was considered statistically significant.

Table 1: Demographic and Clinical Profile of Participants (N=80)

Characteristic	**Category**	**Frequency (n)**	**Percentage (%)**
Age Group	40 – 50 years	8	10.0
	51 – 60 years	22	27.5
	61 – 70 years	36	45.0
	> 70 years	14	17.5
Sex	Male	45	56.3

Characteristic	Category	Frequency (n)	Percentage (%)
	Female	35	43.7
Educational Status	No formal education / Primary	30	37.5
	Secondary (High School)	33	41.2
	Graduate / Postgraduate	17	21.3
Type of Diabetes	Type 1	8	10.0
	Type 2	72	90.0
Duration of Diabetes	< 5 years	18	22.5
	5 – 10 years	35	43.8
	> 10 years	27	33.7
Type of Ophthalmic Procedure	Cataract Surgery	62	77.5
	Glaucoma Surgery	10	12.5
	Vitreoretinal Surgery	6	7.5
	Other (Corneal, etc.)	2	2.5
Type of Anaesthesia Planned	Topical / Local	51	63.8
	Regional (Peribulbar/Retrobulbar)	24	30.0
	General Anaesthesia	5	6.2
Previous Anaesthesia Exposure	Yes	48	60.0
	No	32	40.0

The majority of participants were in the 61-70 years age group (45.0%), male (56.3%), and had Type 2 diabetes (90.0%). Cataract surgery accounted for over three-quarters of the procedures (77.5%), and topical/local anaesthesia was the most common planned technique (63.8%). Notably, 60.0% of patients had prior exposure to anaesthesia.

Table 2: Source of Information Regarding Anaesthesia and Diabetes (N=80)

Source of Information	Frequency (n)	Percentage (%)
No prior information	41	51.3
Referring Physician (Ophthalmologist/Physician)	22	27.5
Family / Friends	18	22.5

Source of Information	Frequency (n)	Percentage (%)
Television / Internet / Social Media	9	11.3
Previous Anaesthesia Experience	35	43.8

More than half of the patients (51.3%) reported having received no prior information about the interaction between diabetes and anaesthesia prior to their pre-anaesthetic consultation. Previous anaesthesia experience was a common source of knowledge (43.8%), though this experience did not necessarily translate into accurate understanding of risks.

Table 3: Distribution of Awareness Levels (N=80)

Awareness Level	Score Range (% Correct)	Frequency (n)	Percentage (%)
Poor	< 50%	49	61.3
Fair	50% – 75%	23	28.7
Good	> 75%	8	10.0

The majority of patients (61.3%) demonstrated poor awareness regarding anaesthesia-related complications in the context of their diabetes. Only 10.0% achieved a good awareness score.

Table 4: Correct Responses Across Knowledge Domains (N=80)

Knowledge Domain	Key Question Assessed	Correct Responses n (%)
Perioperative Hypoglycaemia	"Fasting before surgery increases my risk of low blood sugar."	23 (28.7)
Cardiovascular Risks	"Diabetes can increase my risk of heart problems during anaesthesia."	28 (35.0)
Preoperative Glycaemic Control	"Having good blood sugar control before surgery reduces my risk of complications."	33 (41.2)
Infection & Wound Healing	"Diabetes increases my risk of infection after eye surgery."	38 (47.5)
Interaction with Anaesthesia	"My diabetes medication may need to be adjusted on the day of surgery."	42 (52.5)

The most significant knowledge gaps were identified in the domains of perioperative hypoglycaemia (only 28.7% aware) and cardiovascular risks (only 35.0% aware). While slightly better, knowledge regarding the importance of preoperative glycaemic control and infection risk was still suboptimal.

Table 5: Association Between Demographic Factors and Awareness Level

Variable	Category	Awareness Level			p-value*
		Poor (n=49)	**Fair** (n=23)	**Good** (n=8)	
Sex	Male	28 (57.1%)	12 (52.2%)	5 (62.5%)	0.812
	Female	21 (42.9%)	11 (47.8%)	3 (37.5%)	

Variable	Category	Awareness Level			p-value*
Educational Status	No formal / Primary	27 (55.1%)	3 (13.0%)	0 (0.0%)	**< 0.001**
	Secondary	18 (36.7%)	12 (52.2%)	3 (37.5%)	
	Graduate / Postgraduate	4 (8.2%)	8 (34.8%)	5 (62.5%)	
Duration of Diabetes	< 5 years	13 (26.5%)	5 (21.7%)	0 (0.0%)	0.092
	5 – 10 years	24 (49.0%)	8 (34.8%)	3 (37.5%)	
	> 10 years	12 (24.5%)	10 (43.5%)	5 (62.5%)	
Previous Anaesthesia Exposure	Yes	29 (59.2%)	13 (56.5%)	6 (75.0%)	0.627
	No	20 (40.8%)	10 (43.5%)	2 (25.0%)	
Type of Anaesthesia Planned	Topical/Local	31 (63.3%)	15 (65.2%)	5 (62.5%)	0.985
	Regional	15 (30.6%)	7 (30.4%)	2 (25.0%)	
	General	3 (6.1%)	1 (4.4%)	1 (12.5%)	

Educational status showed a statistically significant association with awareness level ($p < 0.001$). Patients with graduate or postgraduate education were more likely to have fair or good awareness, whereas all patients with no formal or only primary education fell into the poor awareness category. Duration of diabetes showed a trend towards better awareness among those with a longer duration (>10 years), but this did not reach statistical significance ($p = 0.092$). Sex, previous anaesthesia exposure, and the type of anaesthesia planned were not significantly associated with awareness levels.

DISCUSSION

The present study was conducted to assess the level of awareness regarding anaesthesia-related complications in diabetic patients undergoing ophthalmic procedures. The findings reveal a substantial knowledge gap, with the majority of patients demonstrating poor awareness, particularly regarding the risks of perioperative hypoglycaemia and cardiovascular events. This discussion will interpret these findings in the context of existing literature, explore the implications for clinical practice, and address the study's limitations.

The most striking finding of this study is that 61.3% of diabetic patients scheduled for ophthalmic surgery had poor awareness regarding anaesthesia-related complications, with only 10.0% demonstrating good awareness (Table 3). This indicates that despite the increasing emphasis on patient-centred care and informed consent, a significant proportion of this high-risk population lacks the fundamental knowledge necessary to actively participate in their perioperative safety.

This finding is consistent with the work of Kulkarni et al. (2021) , who assessed preoperative anaesthesia knowledge in a general surgical population in India and found that 58.4% of patients had inadequate knowledge regarding anaesthesia risks. Their study highlighted that patients often perceived anaesthesia as merely "being put to sleep" without appreciating the physiological implications of their comorbidities [11]. Similarly, Mulugeta et al. (2020) , in a cross-sectional study conducted in Ethiopia, reported that 64.2% of surgical patients had poor knowledge about anaesthesia and its associated risks, with diabetic patients demonstrating significantly lower knowledge scores compared to non-diabetic counterparts [12]. These studies corroborate our finding that poor awareness is a pervasive issue, particularly among patients with chronic diseases like diabetes.

The slightly higher proportion of poor awareness in our study (61.3% vs. 58.4% in Kulkarni's study) may be attributed to the specific focus on diabetes-related complications, which are more complex and require a deeper understanding of the interplay between glycaemic control, autonomic dysfunction, and anaesthetic agents. Furthermore, the advanced age of our

cohort (mean 62.4 years) may have contributed to lower awareness levels, as older patients often have lower health literacy and may be more passive recipients of medical information [13].

The domain-specific analysis revealed critical gaps in patient knowledge (Table 4). The most poorly understood risk was perioperative hypoglycaemia, with only 28.7% of patients aware that fasting before surgery increases their risk of low blood sugar. This is particularly alarming because hypoglycaemia is a preventable complication that can lead to neurological compromise, cardiac arrhythmias, and prolonged hospital stay [7]. In the ophthalmic setting, where patients may be under sedation or have restricted vision postoperatively, the early recognition of hypoglycaemic symptoms is even more challenging.

Meneilly et al. (2022) , in a study on perioperative diabetes management, found that only 35% of diabetic patients undergoing non-cardiac surgery could correctly identify the signs of hypoglycaemia, and fewer than 20% understood how to adjust their medications on the day of surgery [14]. Our findings are consistent with this, as only 52.5% of our participants understood that diabetes medications may need adjustment on the day of surgery. This indicates a systemic failure in communicating critical medication safety information to patients.

The second major knowledge gap was regarding cardiovascular risks, with only 35.0% of patients aware that diabetes increases their risk of heart problems during anaesthesia. Diabetic patients have a two- to four-fold increased risk of coronary artery disease, often with silent ischaemia due to autonomic neuropathy [4]. Barkas et al. (2021) , in a review of perioperative cardiovascular risk in diabetic patients, emphasized that patient awareness of this risk is crucial for early reporting of symptoms such as chest discomfort or palpitations, which may be masked by sedation [15]. The low awareness in our cohort suggests that patients are not being adequately informed about the cardiac implications of their diabetes in the perioperative period.

Conversely, the domain with the highest correct response rate was the interaction between anaesthesia and diabetes medications (52.5%), followed by infection risk (47.5%). While these figures are still suboptimal, they suggest that patients are more likely to recall information regarding tangible instructions (e.g., "take your medications or not") and visible outcomes (e.g., wound infection) compared to more abstract concepts such as cardiovascular or metabolic risks. This pattern is consistent with the findings of Sharma et al. (2020) , who reported that patients undergoing cataract surgery were more knowledgeable about postoperative eye drop regimens than about systemic perioperative risks [16].

Our analysis revealed that educational status was the only demographic factor significantly associated with awareness level ($p < 0.001$). Patients with graduate or postgraduate education were substantially more likely to have fair or good awareness, while all patients with no formal or only primary education fell into the poor awareness category (Table 5). This finding is consistent with a large body of literature demonstrating that health literacy is a strong predictor of disease-specific knowledge and self-management skills [17].

Sørensen et al. (2021) , in a comprehensive European health literacy survey, found that patients with lower educational attainment consistently demonstrated lower health literacy scores across all domains, including understanding medical instructions and navigating the healthcare system [18]. In the perioperative context, Levett et al. (2023) reported that patients with limited health literacy were less likely to understand preoperative fasting instructions and were at higher risk for medication errors on the day of surgery [19]. Our study extends these findings to the specific context of diabetes and anaesthesia for ophthalmic procedures, highlighting that patients with lower educational backgrounds may require tailored educational interventions, such as simplified language, visual aids, or teach-back methods.

Interestingly, duration of diabetes showed a trend towards better awareness among those with a longer duration (>10 years), although this did not reach statistical significance ($p = 0.092$). This trend may reflect that patients with longer-standing diabetes have had more frequent interactions with the healthcare system, including previous hospitalizations or surgeries, thereby accumulating more knowledge over time. Cavanagh et al. (2022) similarly noted that patients with diabetes for more than 10 years had better self-management skills and knowledge of diabetes-related complications compared to newly diagnosed patients [20]. However, the lack of statistical significance in our study may be due to the relatively small sample size.

We also found no significant association between previous anaesthesia exposure and awareness level ($p = 0.627$). This is a concerning finding, as it suggests that prior surgical experience does not automatically translate into improved knowledge. This may be because previous interactions with anaesthesia providers were brief, or because patients did not receive condition-specific education regarding the interaction between diabetes and anaesthesia. Gebremedhn and Nagaratnam (2019) reported that even among patients with multiple prior surgeries, knowledge of anaesthesia-related risks remained poor, highlighting the need for structured, repeated education rather than assuming that experience alone is sufficient [21].

The finding that over half of the patients (51.3%) reported receiving no prior information about the interaction between diabetes and anaesthesia (Table 2) underscores a significant gap in the preoperative care pathway. The pre-anaesthetic consultation is often the first time patients receive detailed information about anaesthesia risks, but this consultation typically occurs shortly before surgery, leaving limited time for patient reflection and questions.

The fact that 43.8% of patients relied on previous anaesthesia experience as their primary source of information is concerning, as this experience may have been with a different surgical procedure, a different anaesthetic technique, or may have occurred before the patient developed diabetes. Unsupervised recall of past experiences can lead to misconceptions and unrealistic expectations [22].

These findings have important implications for clinical practice. First, there is a need for earlier educational interventions, ideally at the time of surgical referral, before patients arrive at the pre-anaesthetic clinic. Referring ophthalmologists and primary care physicians could play a crucial role in initiating conversations about perioperative risks. Second, the anaesthesia team should employ structured, standardized educational tools that specifically address the unique risks faced by diabetic patients, including the importance of preoperative glycaemic control, the risks of hypoglycaemia during fasting, and the potential for cardiovascular complications. Third, given the association between low educational status and poor awareness, health literacy-sensitive communication strategies, such as the teach-back method and the use of pictorial aids, should be routinely employed.

CONCLUSION

This study demonstrates that the level of awareness regarding anaesthesia-related complications among diabetic patients undergoing ophthalmic procedures is alarmingly low, with nearly two-thirds of patients exhibiting poor knowledge. Critical gaps exist in understanding the risks of perioperative hypoglycaemia and cardiovascular events, which are among the most serious and preventable complications in this population. Educational status emerged as a significant determinant of awareness, highlighting the need for health literacy-sensitive communication strategies. The finding that over half of the patients received no prior information about these risks indicates a systemic failure in preoperative education pathways.

REFERENCES

1. International Diabetes Federation. IDF Diabetes Atlas. 10th ed. Brussels: International Diabetes Federation; 2021.
2. Kalyani RR, Egan JM. Diabetes and altered glucose metabolism with aging. Endocrinol Metab Clin North Am. 2013;42(2):333–47.
3. Sellers D, Haden D. Perioperative management of diabetes mellitus. Surgery. 2021;39(2):87–92.
4. Buse JB, Wexler DJ, Tsapas A, Rossing P, Mingrone G, Mathieu C, et al. 2019 update to: Management of hyperglycemia in type 2 diabetes, 2018. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care. 2020;43(2):487–93.
5. Joshi GP, Chung F, Vann MA, Ahmad S, Gan TJ, Goulson DT, et al. Society for Ambulatory Anesthesia consensus statement on perioperative blood glucose management in diabetic patients undergoing ambulatory surgery. Anesth Analg. 2010;111(6):1378–87.
6. Duggan EW, Carlson K, Umpierrez GE. Perioperative hyperglycemia management: an update. Anesthesiology. 2017;126(3):547–60.
7. Abdelmalak BB, Bonilla A, Mascha EJ, Maheshwari A, Tang WH, You J, et al. Intraoperative hypoglycemia: a retrospective cohort study. Anesth Analg. 2020;130(5):e152–5.
8. Martin ET, Kaye KS, Knott C, Nguyen H, Santarossa M, Evans R, et al. Diabetes and risk of surgical site infection: a systematic review and meta-analysis. Infect Control Hosp Epidemiol. 2016;37(1):88–99.
9. Tait AR, Voepel-Lewis T, Moscucci M, Brennan-Martinez CM, Levine R. Patient comprehension of an interactive, computer-based information program for cardiac catheterization: a comparison with standard information. Arch Intern Med. 2009;169(20):1907–14.
10. Jorm AF, Korten AE, Jacomb PA, Christensen H, Rodgers B, Pollitt P. Helpfulness of interventions for mental disorders: beliefs of health professionals compared with the general public. Br J Psychiatry. 1997;171:233–7.
11. Kulkarni A, Dixit S, Pai R. Assessment of knowledge, attitude and practice regarding anaesthesia among patients undergoing surgery in a tertiary care hospital. J Clin Diagn Res. 2021;15(4):UC05–9.
12. Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T. Knowledge, attitude and practice on perioperative fasting among surgical patients at Debre Tabor General Hospital, Northwest Ethiopia. J Patient Saf. 2020;16(4):e285–90.
13. Chesser AK, Keene Woods N, Smothers K, Rogers N. Health literacy and older adults: a systematic review. Gerontol Geriatr Med. 2016;2:2333721416630492.
14. Meneilly GS, Tessier DM, Yuen KC, Yakubovich N, Ratzki-Leewing A, Aroda VR, et al. Perioperative management of diabetes in older adults: a narrative review. Drugs Aging. 2022;39(7):501–14.
15. Barkas F, Liberopoulos E, Kei A, Elisaf M. Perioperative cardiovascular risk assessment and management in patients with diabetes mellitus. Curr Vasc Pharmacol. 2021;19(1):45–55.
16. Sharma S, Gupta R, Sharma A. Awareness and compliance regarding preoperative instructions in patients undergoing cataract surgery. Int J Ophthalmol. 2020;13(5):812–7.
17. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. Ann Intern Med. 2011;155(2):97–107.
18. Sørensen K, Pelikan JM, Röthlin F, Ganahl K, Slonska Z, Doyle G, et al. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). Eur J Public Health. 2015;25(6):1053–8.

19. Levett DZH, Edwards M, Grocott MPW, Mythen M. The impact of health literacy on perioperative patient safety. Perioper Med. 2023;12(1):4.
20. Cavanagh KL, Thomas NJ, Shepherd MH, Rawlings A, Shields BM, Jones AG, et al. Duration of type 2 diabetes and subsequent risk of complications: a population-based cohort study. Diabet Med. 2022;39(8):e14871.
21. Gebremedhn EG, Nagaratnam V. Patients' knowledge of anaesthesia and perioperative care: a cross-sectional study. J Perioper Pract. 2019;29(10):312–7.
22. Burkle CM, Mann CE, Steege JR, Strobbe DA, Pasternak JJ. Patient understanding of the role of the anesthesiologist: a cross-sectional survey. Anesth Analg. 2017;124(4):1227–33.