



## Original Research Article

# DIGITAL HEALTH ACCESS VERSUS CLINICAL COUNSELING IN SHAPING PATIENT AWARENESS AND ANXIETY ABOUT ANESTHESIA: A CROSS-SECTIONAL STUDY

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**ABSTRACT**

**Background:** Awareness regarding anesthesia and the role of anesthesiologists among surgical patients remains inadequate despite increasing public exposure to digital health information. Although internet-based health resources are widely accessible, their influence on perioperative understanding and anxiety remains uncertain. This study aimed to evaluate patient awareness regarding anesthesia, assess digital health access and determine whether such exposure influences preoperative anxiety.

**Materials and Methods:** This cross-sectional observational study was conducted at a tertiary care teaching hospital over six months in 2024. A total of 178 adult patients scheduled for elective surgical procedures were included. Data were collected using a structured questionnaire consisting of 16 items assessing awareness regarding anesthesia and anesthesiologists, access to digital health information, and perioperative concerns related to surgery and anesthesia. Descriptive statistics and Chi-square tests were used for analysis. A p-value <0.05 was considered statistically significant.

**Results:** Overall awareness regarding anesthesia was moderate (55.55%), demonstrating a relatively better understanding of basic anesthesia-related concepts, while awareness of broader perioperative role of anesthesiologists remained limited. Digital access (81.46%) remained high; however anxiety continued to be prevalent among patients (90.4%). Pain was identified as the most common perioperative concern (61.4%). No significant association was observed between digital health access and reduction in anxiety ( $\chi^2 = 0.002$ , p = 0.967).

**Conclusion:** Access to digital health information may improve exposure to anesthesia-related information; but does not adequately address perioperative concerns or reduce anxiety. Structured pre-anesthesia counselling continues to play an important role in improving patient understanding, clarifying misconceptions, and addressing individual concerns.

**Keywords:** Anesthesia, Health Literacy, Counseling, Preoperative Care, Anxiety, Internet, Health communication.

**INTRODUCTION**

Anesthesiology forms an essential component of perioperative care that extends well beyond the administration of drugs during surgery. The specialty encompasses pre-anesthetic evaluation,

intraoperative management, postoperative care, pain management, intensive care support, and emergency airway management. Despite the expanding scope of the specialty, awareness regarding anesthesia and the role of anesthesiologists among the general public remains limited.<sup>[1-4]</sup>

Previous studies have shown that many patients are unable to identify anesthesiologists as independent medical specialists and often associate anesthesia care primarily with surgeons or operating room staff.<sup>[2,5]</sup> Patients frequently have limited understanding regarding the broader clinical responsibilities of anesthesiologists outside the operating theatre, particularly in critical care, pain medicine, interventional radiology, and cardiology services.<sup>[1,4,6]</sup>

Patient-related factors such as age, education, prior surgical exposure, and previous interaction with healthcare systems may influence awareness levels.<sup>[2,4]</sup> However, knowledge gaps continue to persist across different population groups.

This lack of understanding regarding anesthesia may increase preoperative anxiety and fear about surgery. Common concerns include fear of pain, anesthesia-related complications, delayed recovery, failure to awaken after surgery, and uncertainty regarding surgical outcomes.<sup>[5,7]</sup> Such concerns may influence patient confidence and participation during perioperative decision-making.

Over the past decade, rapid expansion of smartphone usage and internet accessibility has resulted in increased exposure to health-related information through digital platforms. During the COVID-19 pandemic, anesthesiologists gained increased visibility because of their contribution in airway management, intensive care, and emergency services. Although digital platforms have increased access to health information, whether such exposure improves understanding and reduces preoperative anxiety remains unclear.<sup>[7]</sup>

This study was undertaken to evaluate patients' awareness regarding anesthesia and anesthesiologists, access to digital health information, and examine its influence on preoperative anxiety using the Amsterdam Preoperative Anxiety and Information Scale (APAIS).<sup>[8]</sup>

## MATERIALS AND METHODS

This cross-sectional observational study was conducted in a tertiary care hospital in South India over six months in 2024 involving patients posted for elective surgeries from various surgical departments after obtaining informed consent.

**Study Population:** A total of 200 patients were enrolled, 22 patients were excluded due to incomplete responses or failure to meet inclusion criteria. Elective surgical patients aged between 18 and 65 years belonging to ASA physical status I–III, willing to participate in the study, and were able to understand and respond to the questionnaire in the regional language were included for the study.

Emergency surgical procedures, critically ill patients, patients with cognitive impairment, patients unwilling to participate were excluded from this study. Finally, 178 patients' responses were analysed for results.

**Questionnaire Development:** Data were collected using a structured questionnaire developed after review of relevant literature related to anesthesia awareness and preoperative anxiety. The questionnaire was reviewed by subject experts for content validity and internal consistency was assessed using Cronbach's alpha. Pilot testing was performed to ensure clarity and comprehensibility. Preoperative anxiety was assessed using Amstradam Preoperative Anxiety and Information Scale (APAIS).

The questionnaire consisted of 16 items grouped into three domains:

### A. Awareness Regarding anesthesia (Q1–Q10)

- Need for anesthesia
- Identification of anesthesiologist
- Consent and safety aspects
- Intra-operative monitoring
- Roles of anesthesiologists beyond the operating theatre

### B. Digital Health Access (Q11–Q14) Smartphone usage:

- Access to digital information regarding surgery
- Access to digital information regarding anesthesia
- Awareness regarding the role of anesthesiologists during the COVID-19 pandemic

### C. Patient Concerns and Anxiety (Q15–Q16)

Assessed presence of anxiety related to surgery or anesthesia, later assessed using APAIS scale and a score of 11 or more was considered as preoperative anxiety.

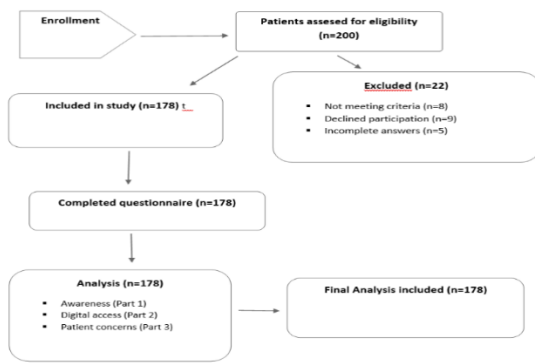
Presence of Common perioperative concerns include pain, disease outcome, duration of surgery, hospital stay, anesthesia-related complications, and financial burden.

**Data Collection:** Participants were interviewed following pre-anesthetic evaluation, the day prior to surgery. Responses were recorded anonymously.

**Statistical Analysis:** Data were entered into Microsoft Excel and analyzed using SPSS. Categorical variables were expressed as frequencies and percentages. Association between digital health access and patient anxiety was analyzed using Chi-square test. A p-value <0.05 was considered statistically significant.

## RESULTS

178 patients completed the questionnaire and considered for analysis [Figure1].



**Figure 1: Flow chart of study process.**

**Demographic Characteristics:** Among the 178 study participants, the majority belonged to the age group of 21–40 years. Female participants constituted a greater proportion of the study population (60.7%). A smaller proportion of patients reported associated comorbidities (19.1%), while nearly one-third had undergone previous surgery (28.7%).

Patients with previous surgical exposure appeared relatively familiar with perioperative processes and anesthesia-related information. However, awareness gaps were observed across different demographic groups [Table 1].

**Table 1: Demographic characteristics and their influence on awareness (n = 178)**

		Count	Column N %
Age (years)	18 - 20	5	2.8%
	21 - 30	53	29.8%
	31 - 40	61	34.3%
	41 - 50	41	23.0%
	Above 50	18	10.1%
	Total	178	100.0%
Sex	Female	108	60.7%
	Male	70	39.3%
	Total	178	100.0%
Co morbid illness	Absent	144	80.9%
	Present	34	19.1%
	Total	178	100.0%
Previous surgery	Absent	127	71.3%
	Present	51	28.7%
	Total	178	100.0%
Duration since	<5yrs	24	47.1%
	5 - 10yrs	14	27.5%
	Above 10yrs	13	25.5%
	Total	51	100.0%

**Awareness Regarding Anesthesia:** Participants demonstrated relatively better understanding regarding the necessity of anesthesia for surgery (73.0%), the need for informed consent (79.8%), and the importance of intraoperative monitoring (69.7%). Awareness was also high regarding perioperative safety-related practices (95.5%).

However, knowledge regarding the broader clinical role of anesthesiologists remained limited with only 32.6% correctly identifying anesthesiologists as independent specialists, while 7.9% to 39.9% knew them for their out of theatre roles [Figure 2]. This suggests that patients were generally aware of basic information but had limited insight about the wider scope of anesthesia practice [Table 2].

## Patient Awareness, Digital Access and Anxiety Regarding Anesthesia (N = 178)

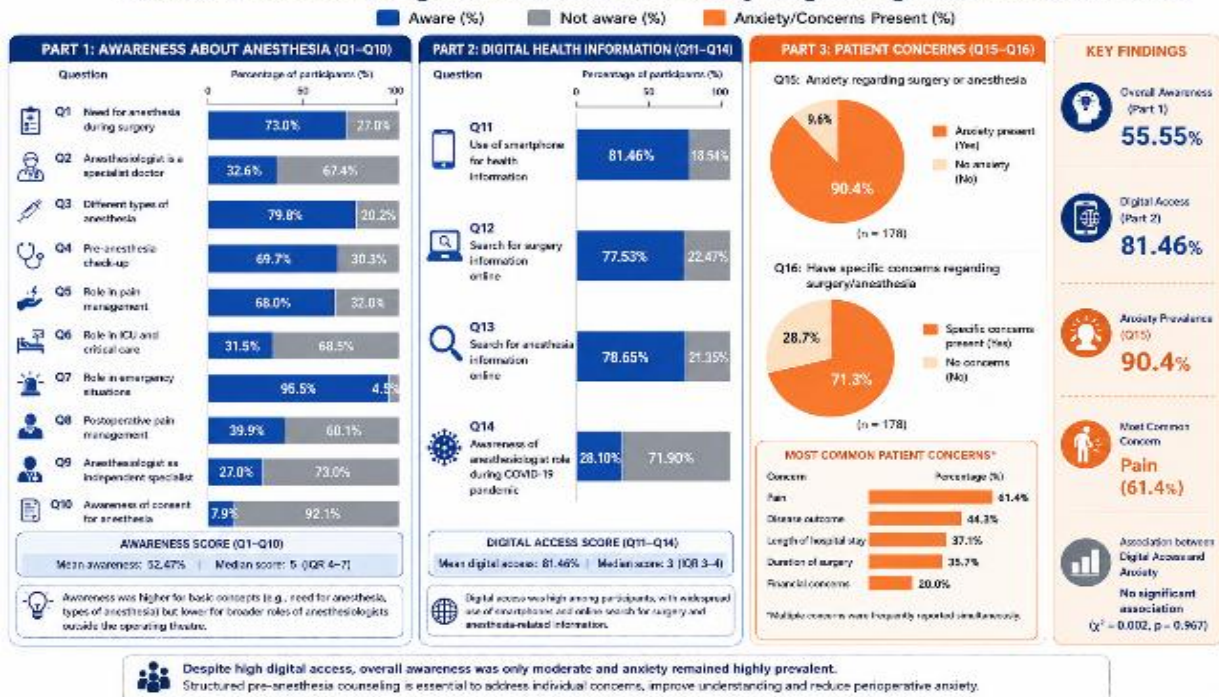


Figure 2: Percentage of awareness across questionnaire items

Table 2: Awareness Analysis

	Not aware		Aware		Total	
	Count	Row N %	Count	Row N %	Count	Row N %
Part 1						
Q1	48	27.0%	130	73.0%	178	100.0%
Q2	120	67.4%	58	32.6%	178	100.0%
Q3	36	20.2%	142	79.8%	178	100.0%
Q4	54	30.3%	124	69.7%	178	100.0%
Q5	57	32.0%	121	68.0%	178	100.0%
Q6	122	68.5%	56	31.5%	178	100.0%
Q7	8	4.5%	170	95.5%	178	100.0%
Q8	107	60.1%	71	39.9%	178	100.0%
Q9	130	73.0%	48	27.0%	178	100.0%
Q10	164	92.1%	14	7.9%	178	100.0%
Part 2						
Q11	33	18.54%	145	81.46%	178	100.0%
Q12	40	22.47%	138	77.53%	178	100.0%
Q13	38	21.35%	140	78.65%	178	100.0%
Q14	128	71.9%	50	28.1%	178	100.0%
Part 3						
Q15	17	9.6%	161	90.4%	178	100.0%
Q16	51	28.7%	127	71.3%	178	100.0%

**Overall awareness:** Based on cumulative questionnaire scoring, Moderate awareness levels were observed in the majority of participants (66.9%) [Table 3], while high awareness was noted in only 23.6% and 9.6% demonstrated low awareness.

Table 3: Response scores of patients

Score*	Frequency	Percentage(%)
Low Awareness(0-5)	17	9.6
Moderate awareness(6-10)	119	66.9
High awareness(11 - 16)	42	23.6
Total	178	100.0

(\* Score - number of correct answers)

Overall awareness regarding anesthesia was moderate, with a mean awareness score of 55.55%, while most of them had access to smartphones

(81.46%), it's utilisation to acquire anesthesia-related knowledge (52.47%) was limited.

Domain-wise assessment showed that although participants had substantial exposure to digital

resources, comprehensive understanding regarding

anesthesia remained only moderate [Table 4].

**Table 4: Representation of overall awareness level across questionnaire.**

Category	number	Mean	Standard deviation	Level of awareness (%)
Part 1	178	5.25	2.19	52.47
Part 2	178	3.26	0.47	81.46
Part 3	178	0.38	0.64	19.10
Overall awareness	178	8.89	2.47	55.55

**Digital Health Access and its influence on anxiety:**

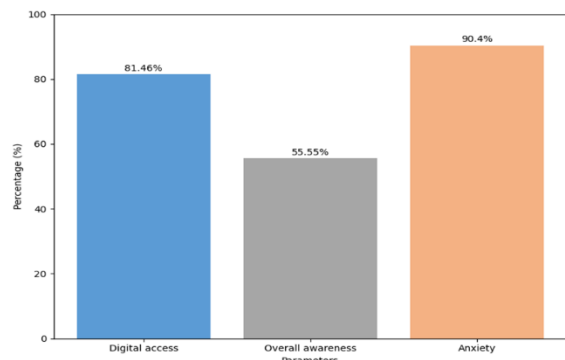
About 81.46% of patients had smartphones and internet exposure, with only three-quarters of the patients using it to look for information about

surgery (77.53%) and anesthesia (78.65%) [Table 2]. Despite that overall awareness remained moderate (55.55%), and did not appear sufficient to alleviate perioperative concerns [Table 5].

**Table 5: Digital Access and Its Influence**

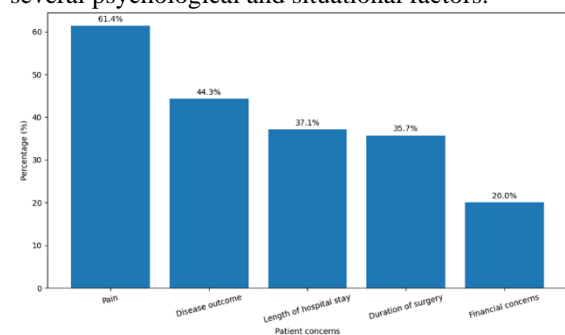
Parameter	Observation
Digital access	81.46%
Awareness	55.55%
Anxiety	90.4%

Preoperative Anxiety regarding surgery and anesthesia was indicated by responses to Q15 and was later assessed using APAIS scale. About 90.4% patients were still anxious regarding their course in hospital in spite of most of them having exposure to health information. No statistically significant association was observed between digital health access and reduction in patient anxiety ( $\chi^2 = 0.002$ ,  $p = 0.967$ ) [Figure 3].



**Figure 3: Digital Access and Its Influence**

**Patient Concerns:** Pain was identified as the most common concern(61.4%), followed by concerns regarding disease outcome, duration of hospital stay, and duration of surgery (Figure 4). Many patients reported multiple concerns simultaneously, suggesting that preoperative anxiety is influenced by several psychological and situational factors.



**Figure 4: Distribution of patient concerns related to surgery and anesthesia.**

**DISCUSSION**

The present study evaluated patient awareness regarding anesthesia and explored whether increasing exposure to digital health information influences preoperative anxiety. Although access to online medical resources was high, awareness regarding anesthesia and the broader role of anesthesiologists remained only moderate, while preoperative anxiety continued to be highly prevalent among surgical patients. Earlier studies by Bhandary et al. and Singh et al. also reported inadequate public recognition of anesthesiologists and poor awareness regarding their role outside the operating theatre.<sup>[1,2]</sup> Similar concerns regarding specialty visibility have been described in surveys conducted among both surgical patients and paramedical personnel.<sup>[3-5]</sup> This finding may reflect the continuing tendency of patients to associate perioperative care predominantly with surgeons rather than with the anesthesia team. Despite major advancements in perioperative medicine and critical care services, public understanding of the specialty continues to lag behind its expanding clinical responsibilities.<sup>[6]</sup> Preoperative anxiety remained highly prevalent among the study population and was assessed using the APAIS, a validated tool widely used for evaluating anxiety related to anesthesia and surgery.<sup>[7,8]</sup> Pain emerged as the most common perioperative concern, followed by uncertainty regarding disease outcome, duration of hospital stay, and duration of surgery. Jjala et al. demonstrated that perioperative anxiety may persist despite exposure to multimedia educational material, emphasizing that information alone may not completely alleviate emotional distress associated with surgery.<sup>[7]</sup>

Digital access among participants was notably high (81.46%). Increasing internet penetration and accessibility of online medical content have substantially changed the way patients approach healthcare information.<sup>[9,10]</sup> During the COVID-19

pandemic, anesthesiologists gained increased visibility because of their contribution to airway management, intensive care, and emergency services.<sup>[11,12]</sup> Nevertheless, overall awareness levels in the present study remained only moderate. Although many patients actively sought information regarding their medical conditions, online resources were often fragmented, generalized, or difficult to interpret without professional guidance.

A recent systematic review by Shebl et al. highlighted the association between preoperative anxiety and adverse perioperative outcomes, reinforcing the clinical importance of timely anxiety assessment and counselling.<sup>[13]</sup> The absence of a statistically significant association between digital health access and reduction in anxiety suggests that emotional reassurance may depend more on direct interaction with healthcare professionals than passive exposure to online information. Pre-anesthetic counseling provides patients with an opportunity to clarify misconceptions, discuss fears, and better understand perioperative care in a personalized manner. Studies evaluating structured counseling interventions have demonstrated improvement in patient confidence and reduction in anxiety following focused preoperative communication.<sup>[14–16]</sup>

Another notable observation in the present study was that many patients reported multiple concerns simultaneously. This indicates that perioperative anxiety is multifactorial and influenced not only by fear of anesthesia but also by uncertainty regarding surgical outcomes, hospitalization, financial burden, and postoperative recovery. Addressing these concerns therefore requires a broader patient-centered communication strategy rather than isolated information delivery.

The findings of this study support the continuing importance of effective communication during pre-anesthetic evaluation. Although digital educational resources may complement patient education, they cannot replace individualized counseling provided by anesthesiologists. Combining accurate digital health resources with structured preoperative counseling may help improve patient understanding, enhance confidence, and support better perioperative experiences.

**Limitations:** Awareness and anxiety were assessed using self-reported responses, which may be influenced by response bias. In addition, the study did not assess the quality or reliability of online resources accessed by patients. Further multicentric studies may provide a more comprehensive understanding regarding the relationship between digital health literacy and preoperative anxiety.

## CONCLUSION

The present work demonstrates that although digital health access has improved exposure to anesthesia-related information, it does not necessarily translate

into improved understanding or reduction in preoperative anxiety. Awareness regarding the wider role of anesthesiologists remains limited among patients.

Structured pre-anesthesia counselling continues to play an important role in addressing patient concerns, improving perioperative understanding, and correcting misconceptions related to anesthesia. Combining digital educational resources with individualized counseling strategies may contribute towards better patient-centered perioperative care.

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