



Anaesthesia-Related Internet Search: A Survey with Turkish Participants

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Abstract

Objective: The Internet may facilitate active participation of the patient in specifying the priorities of disease management and improve rehearsal for awaiting interventions. In this study, we sought to assess the relationship of Internet use with the anaesthesia-related variables.

Methods: A 15-question survey was formed involving questions about demographics, Internet use habits and awareness of the planned interventions. A previous online search for anaesthesia and topics of search were specifically asked. Searching for anaesthesia on the Internet was determined as the primary end-point.

Results: One-hundred and fifty-seven patients (41.1 ± 14.4 years, 63.1% female) responded to our survey. The ratio of the participants who had previous experience of anaesthesia was 62.4%. Seventy-nine percent of the subjects had an Internet access frequency of couple of times a week or more often. However, only 39.5% ($n = 49$) of those specifically searched about anaesthesia on the Internet. Individuals who searched for anaesthesia on the Internet were younger and used to be online everyday. Regional anaesthesia was more frequently preferred method in this group. However, previously discussed anaesthesia issues with the surgeon were designated as the only closely associated variable of the primary end-point (OR = 0.25, 95% CI [0.102-0.616], $P = .003$).

Conclusion: Possibly due to local cultural myths, our participants were more eager to get answers to their concerns about anaesthesia when compared with their counterparts in previous reports. Although Internet search habits played a role in this sense, the entity of “online search for anaesthesia” was closely associated only with having the surgeons’ ideas about anaesthesia procedure.

Keywords: Anaesthesia, Internet, online systems, pre-operative period

Introduction

The Internet has been increasingly used by patients in the last two decades to obtain information about their healthcare providers and disease states.¹⁻³ This attitude was also encouraged by physicians since having detailed knowledge of the condition may enhance patients’ adherence to the treatment and help to perceive the extent of potential complications through active participation in the decision-making process.^{1,4} Nevertheless, clinical consultations still play a vital role in this sense. Accordingly, it seems unlikely that the online information exhibiting a questionable quality may replace the reassurance provided by a trusted physician in the close future.⁴

On the other hand, the patient–specialist interaction mostly remains limited to pre-operative interview in anaesthetic care. However, time constraints and patient-related issues, such as insufficient knowledge about the anaesthesia and concerns related to the magnitude of the surgical risk, may restrict the content of the interview to subjective unpleasant experiences like pain, nausea and recall.^{5,6} Moreover, shortening of the time interval between the first diagnosis and therapeutic intervention further narrows the preparation phase for the upcoming procedure during which web-based information can play a considerable role particularly by increasing the awareness about the actual components of the final outcome.⁶

To demonstrate this fact, we composed a survey interrogating the participants’ socioeconomic parameters, general and condition-specific web search habits and awareness about the procedures. We sought to assess the relationship of Internet use with the indicated anaesthesia-related variables.

Methods

This study was conducted in a centre performing roughly 3,000 surgical procedures per year with the presence of an anaesthesiologist. Among the entire spectrum of the interventions, urological, obstetric and gynecological, and general surgical operations constitute more than half of the procedures. For these operations, once the necessity of anaesthesia is identified, patients are referred to a pre-operative interview. For the vast majority of cases, planned surgery is performed in a week since then. At the interview, physical examination of the systems and basic blood tests are checked to define comorbid diseases, pre-operative risk and technical issues regarding airway management and others like avoidance of certain drugs. This visit is also the one where patients are briefed about the methods, potential complications and adverse effects of anaesthesia and cumulative pre-operative risk. An informed consent was obtained after all concerns have been clarified.

To evaluate the relationship of Internet use and anaesthesia knowledge, a 15-question survey was formed involving questions about educational background, occupational status, Internet use frequency and access devices, and awareness of the disease and planned interventions (Appendix 1). A previous online search for anaesthesia, topics of search, and preferred anaesthesia method were specifically asked. Once eligibility for inclusion was confirmed, an informed consent for the use of data was received from all participants. This study was approved by the local ethical committee of Bakirkoy Sadi Konuk Training and Research Hospital (Date. 17/02/2020, Protocol No. 2019/293). hospital. Thereby, the design and conduction of the investigation were consistent with global ethical standards.

A total of 400 consecutive patients from the anaesthesia outpatient clinic were assessed for eligibility. Criteria for inclusion were being a candidate for elective surgery, age of 18 years or more, speaking Turkish as a native language, and

literacy in Turkish. Patients who were unwilling to participate by giving consent were excluded.

Searching for anaesthesia on the Internet was determined as the primary end-point. Participants were also grouped according to the frequency of Internet use (NU = nonusers, SU = seldom users [couple of times a week], and FU = frequent users).

Statistical Analysis

The Shapiro–Wilk test was used for testing the normality of continuous variables. Variables with normal distribution were expressed as mean \pm standard deviation (SD). Categorical variables were designated as percentage (number of cases). Unpaired t and ANOVA tests were used to compare continuous variables between two and three independent groups, respectively. Pearson Chi-square test was used to compare categorical variables. Logistic regression analysis was performed to identify the determinants of the primary outcome. In all analyses, a *P*-value below .05 was considered significant. Statistical Package for the Social Sciences (SPSS) version 22.0 (IBM SPSS Corp.; Armonk, NY, USA) was used to perform the analyses.

Results

Two-hundred and eighty-eight patients were found to be eligible for inclusion and 157 of them (54.5%) responded to our survey. The mean age of the participants was 41.1 ± 14.4 years, and 63.1% ($n = 99$) of them were female. The subject who would perform the upcoming procedure was urology, obstetrics, and gynaecology, or general surgery in 68.8% of the sample population (Figure 1A). Twenty-six percent ($n = 40$) of the population had discussed the anaesthetic procedure with the surgeon. The distribution of the consultation rates of anaesthetic procedures among surgical sections was displayed in Figure 1B.

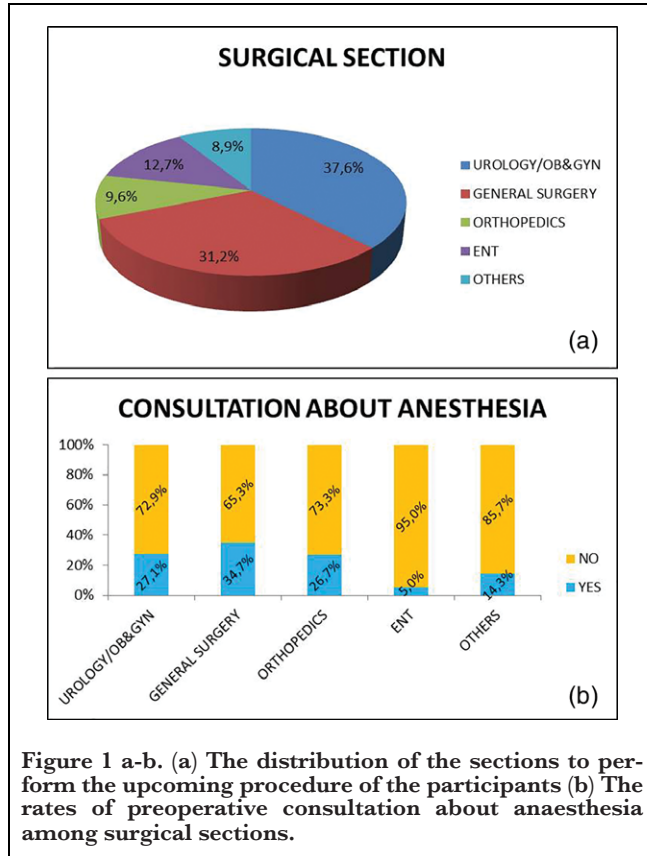
Thirty-one percent ($n = 49$) of the patients was high school graduates and only 18.5% ($n = 29$) of them had a college degree. Fifty-nine individuals (37.6%) had a regular job. Seventy-nine percent of the participants ($n = 124$) had an Internet access. However, only 39.5% ($n = 49$) of those specifically had searched about anaesthesia on the Internet. The search topics were displayed in Figure 2.

When participants were grouped according to the frequency of Internet use, frequent users (FU group, $n = 94$) were significantly younger, more commonly occupied, and better-educated. The fraction of individuals settled in a city was also higher in this group. Moreover, the frequency of patients who were informed about the surgical procedure and those searched specifically anaesthesia on the Internet was higher in the FU group, as expected (Table 1).

Individuals who searched for anaesthesia on the Internet (IS +, $n = 49$) were younger and used to be online everyday.

Main Points

- Turkish population has social and cultural myths focusing on specific terms of apprehension like perpetual comatose state after anaesthesia or anaesthesia-related death in the operating room.
- Regarding the limited physician–patient interaction in pre-operative anaesthetic care, online searching might be a reasonable option for rehearsal of the procedure.
- Here, we prepared a questionnaire that sought to assess the relationship between Internet use and concerns related to anaesthesia.
- The results of this survey might highlight the necessity of sparing more time for the pre-operative interviews to increase the level of knowledge in our patients.
- We should also put the effort into the generation of qualified, referenced, clear, and comprehensive online Turkish data responding to these concerns.

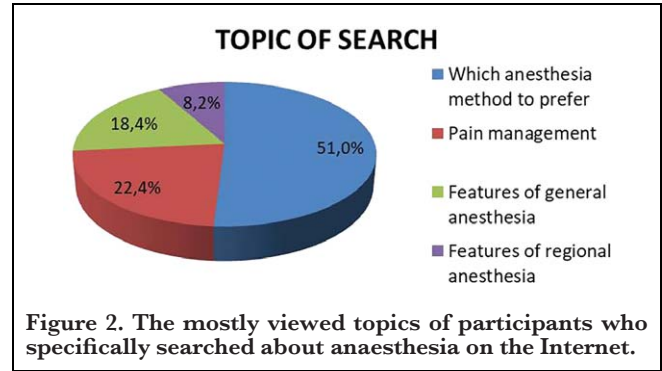


Participants in this group more commonly had a tandem use of PCs and mobile devices for access. Regional anaesthesia was more frequently the preferred method in this group. Nonusers were excluded (n = 124) for this comparison (Table 2).

A logistic regression analysis was performed to identify the predictors of the primary outcome (Table 3). According to the results of this analysis, previously discussing the anaesthesia issues with the surgeon was designated as the only associated variable (OR = 0.25, 95% CI [0.102-0.616], P = .003).

Discussion

Perception of the term “anaesthesia” and concerns related to the procedure or the outcome may vary between different cultures.⁶⁻¹¹ For Turkish patients, a perpetual comatose state after anaesthesia or anaesthesia-related death in the operating room was established as major subjects of apprehension in previous studies.^{8,9} Özvurmaz et al.⁸ depicted the rate of this dread up to 70% in their sample population living in rural areas. This number was as high as the incidences of concerns about periprocedural pain and recall reported in this study. Knowledge about the technique, potential risks of the procedure, and actual job definition of the anaesthetist was also documented to be underappreciated in the general population.^{8,9,12} In our study, awareness about the diseased



organ system, surgical section, and surgical procedure was over 90%. However, anaesthesia was accurately defined only by 22.3% of the participants. Therefore, it is mandatory to spare time for these issues while consulting the patients in pre-operative assessment. Additionally, providing informative sources not only to diseased subjects but also to the healthy population may increase global awareness, thus reduce the decisional conflict and pre-operative anxiety. These informative messages might be transmitted by printed material or well-designed websites.⁴⁻⁶ The latter may also warrant a larger spectrum of access and reduced costs.⁵

However, the quality of the content and readability of websites are also questionable. It was confirmed by various investigations that websites suggested with higher priority by search engines may involve insufficient or misleading information about anaesthesia.^{1,5,13,14} As a probable consequence of this, the fraction of participants who had searched about anaesthesia on the Internet remained at 3.5-7% in several studies.¹⁻³ Nevertheless, patients had also declared that they would be receptive to being directed to reliable online sources.¹ In our sample population, 39.5% of the participants accessing the Internet stated that they had searched particularly about anaesthesia. This rate was distinctively higher as compared to similar surveys held in different countries. This finding was possibly because of culture-specific myths regarding anaesthesia complications. We should also emphasise that patients who had experience of previous anaesthesia were relatively fewer than a similar report (% 62.4 vs. 83), in which the history of receiving anaesthesia was determined as the only indicator of not searching about it.³

Frequent Internet users in our sample population were younger, better-educated, and actively working individuals, and they were profoundly settled in the cities. Despite this fact, authors of various investigations had also reported that the frequency of patients demanding higher medical care had less access to online sources.^{3,4} Accordingly, educational and occupational status lost significance when Internet search was taken as the distinctive variable in our study. Although daily access to the Internet and using various devices for access were more frequent among patients who had

Table 1. Comparison of Demographic Characteristics, Internet Habits, Procedure-related Awareness Rates, and Anaesthesia-related Search Facts of the Participants between Groups of Different Internet Access Frequencies

	NU (n = 33)	SU (n = 30)	FU (n = 94)	P
Age, years (mean ± SD)	55.3 ± 15.4	44.4 ± 12.1	35 ± 10.4	<.01
Gender, female % (n)	63.6 (21)	73.3 (22)	59.6 (56)	.40
Occupational status, % (n)				.02
Working	18.2 (6)	33.3 (10)	45.7 (43)	
Retired	27.3 (9)	13.3 (4)	4.3 (4)	
Not working	51.5 (17)	50 (15)	40.4 (38)	
Student	3 (1)	3.3 (1)	9.6 (9)	
Educational status, % (n)				<.001
Primary schools	81.8 (27)	70 (21)	33 (31)	
High school	15.2 (5)	23.3 (7)	39.4 (37)	
License and above	3 (1)	6.7 (2)	27.7 (26)	
Settled in a city, % (n)	48.5 (16)	70 (21)	78.7 (74)	<.01
Satisfactory income, % (n)	69.7 (23)	73.3 (22)	71.3 (67)	.95
Internet access device, % (n)				.11
Personal computer	N/A	6.7 (2)	3.2 (3)	
Smart phone or tablet		86.7 (26)	73.4 (69)	
Both		6.7 (2)	23.4 (22)	
Previous experience of anaesthesia, % (n)	72.7 (24)	60 (18)	59.6 (56)	.39
Awareness of the surgical procedure, % (n)	81.8 (27)	83.3 (25)	96.8 (91)	.01
Awareness about the organ of interest, % (n)	97 (32)	96.7 (29)	89.4 (84)	.23
Awareness about the surgical section, % (n)	90.9 (30)	90 (27)	96.8 (91)	.24
Perception of anaesthesia, % (n)				.20
Sleep state	42.4 (14)	50 (15)	56.4 (53)	
Analgesia	18.2 (6)	16.7 (5)	5.3 (5)	
Insensibility	12.1 (4)	20 (6)	14.9 (14)	
All of the above	27.3 (9)	13.3 (4)	23.4 (22)	
Selecting 'all of the above' in Q11 % (n)	27.3 (9)	13.3 (4)	23.4 (22)	.38
Discussed anaesthesia procedure with the surgeon, % (n)	24.2 (8)	20 (6)	27.7 (26)	.69
Searched anaesthesia on Internet, % (n)	N/A	23.3 (7)	44.7 (42)	.03
Search topic, % (n)*	N/A			.13
Which method to prefer		14.3 (1)	57.1 (24)	
Pain management		57.1 (4)	16.7 (7)	
Features of general anaesthesia		28.6 (2)	16.7 (7)	
Features of regional anaesthesia		0 (0)	9.5 (4)	
Preferred regional anaesthesia, % (n)	27.3 (9)	16.7 (5)	21.3 (20)	.59

Abbreviations: NU, nonuser; SU, seldom-user (couple of times a week), FU, frequent-users (everyday).

*For this parameter, the number of participants involved in SU and FU groups were 7 and 42, respectively.

searched for anaesthesia, the regression analysis did not verify an evident association.

Among participants who searched the web for anaesthesia, the most popular topic was the method of choice (51%). It was followed by pain management and features of the tech-

niques in our population. Previously published studies expressed that side effects of anaesthesia particularly the most unpleasant and noticeable ones had gained priority among the entire list of concerns.^{5,6} However, the poor quality of the content in websites limits the translation of appropriate information. This situation may derive a drawback

	IS (-) (n = 75)	IS (+) (n = 49)	P
Age, years (mean \pm SD)	39.1 \pm 11.3	34.4 \pm 11.4	.03
Gender, female % (n)	60 (45)	67.3 (33)	.41
Occupational status, % (n)			.42
Working	41.3 (31)	44.9 (22)	
Retired	8 (6)	4.1 (2)	
Not working	45.3 (34)	38.8 (19)	
Student	5.3 (4)	12.2 (6)	
Educational status, % (n)			.57
Primary schools	45.3 (34)	36.7 (18)	
High school	34.7 (26)	36.7 (18)	
License and above	20 (15)	26.5 (13)	
Settled in a city, % (n)	76 (57)	77.6 (38)	.84
Satisfactory income, % (n)	74.7 (56)	67.3 (33)	.38
Frequent Internet user, % (n)	69.3 (52)	85.7 (42)	.04
Internet access device, % (n)			.03
Personal computer	5.3 (4)	2 (1)	
Smart phone or tablet	82.7 (62)	67.4 (33)	
Both	12 (9)	30.6 (15)	
Previous experience of anaesthesia, % (n)	60 (45)	59.2 (29)	.93
Selected "all of the above" in Q11, % (n)	24 (18)	16.3 (8)	.31
Discussed anaesthesia procedure with the surgeon, % (n)	14.7 (11)	42.9 (21)	<.01
Preferred regional anaesthesia, % (n)	26.7 (20)	10.2 (5)	.03

Abbreviations: IS, Internet search for anaesthesia.

	Regression coefficient	Confidence interval 95%	P
Age	.97	0.93-1.00	.11
Daily access to Internet	.57	0.20-1.63	.30
Using both PC and mobile devices for access	.47	0.17-1.30	.14
Discussion of anaesthetic procedure with the surgeon	.25	0.10-0.62	<.01

about the optimal rehearsal of the procedure and may also shift patients' expectations.^{1,2,4} Corcoran et al.⁹ reported that 30-40% of online sources had lacked crucial information on procedural details and side effects of anaesthesia. Moreover, approximately 60% of these sources were anonymous and unreferenced. It should be denoted that our population should have had very limited access to sources in the English language concerning the relatively low level of educational status. Unfortunately, assessing the quality of online sources in the Turkish language was beyond the scope of this investigation.

The frequency of the participants who preferred regional technique over general anaesthesia was surprisingly lower in the group of patients who searched particularly for anaesthesia. This finding may suggest that general knowledge of neuraxial methods is also insufficient. Sagir et al.¹⁵ stated that visual informative material had reduced the preoperative anxiety in patients awaiting spinal anaesthesia. Correlatively, Groves et al.⁴ performed an intervention in their sample population and confirmed that using appropriate online tools may shift patients' preferences toward regional anaesthesia. Consequently, raising awareness about the

advantages of neuraxial techniques is a global necessity. However, we had no precise evidence to associate this preference with Internet habits.

In addition to these, pre-operative anaesthesia consultation with the surgeon should be highlighted as a remarkable component of patient preparation. This rate was 25.4% in our sample population. In two previous reports, it remained at 10 and 17%.^{1,2} In the former, the authors declared that preoperative consultation with the surgeon or general practitioner was significantly associated with Internet search.² It became evident that our population required the assistance of the surgeon for the rehearsal of anaesthesia as so online information. In this context, preoperative consultation with the surgeon was closely related to the primary outcome in our study.

Possibly due to local cultural myths, our participants were more eager to get answers to their concerns about anaesthesia when compared with population samples investigated in previous reports. Although Internet search habits played a role in this sense, the entity of ‘specific online search for anaesthesia’ was closely associated only with having the surgeons’ ideas about anaesthesia procedure before the preoperative interview.

Ethics Committee Approval: Ethics committee approval was received from the local ethical committee of Bakırköy Sadi Konuk Training & Research Hospital (Date:17.02.2020, Protocol No: 2019/293).

Informed Consent: Written informed consent was obtained from all patients who participated in this study.

Peer-review: Externally peer-reviewed.

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Conflict of Interest: The authors have no conflicts of interest to declare.

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Appendix 1—Survey

1. Please define your occupational status.
 - a. Working in a paid job
 - b. Retired
 - c. Not working
 - d. Student

2. Please define your educational status.
 - a. Primary or intermediate school
 - b. High school
 - c. License or above

3. Do you think your income is sufficient for your expenditures?
 - a. Yes
 - b. No

4. Please pick one of the regions you mostly lived in.
 - a. Suburbs
 - b. City center

5. How frequent do you use Internet?
 - a. None
 - b. Couple times a week
 - c. Everyday

6. Which device do you prefer to access to Internet?
 - a. Laptop/desktop
 - b. Smart phone/tablet
 - c. Both

7. Have you ever been anaesthetized?
 - a. Yes
 - b. No

8. Which organ of your body is diseased? Please define.
.....

9. Do you exactly know which intervention is planned for your disease? Please define.
 - a. Yes
 - b. No

10. Do you know which surgical section will perform your intervention? Please define.
.....

11. What does the word “Anaesthesia” express to you?
 - a. Sleep state
 - b. Not feeling pain
 - c. Feeling nothing
 - d. All of the above

12. Did you ask any questions to your surgeon about the anaesthesia procedure or did he/she inform you about this issue?
 - a. Yes
 - b. No

13. Have you searched about anaesthesia on the Internet?
 - a. Yes
 - b. No

14. If the answer is “Yes” for Q13, which of the below-listed topics did you mostly search about?
 - a. Method of choice (regional or general)
 - b. Pain management
 - c. Features of general anaesthesia (including side effects)
 - d. Features of regional anaesthesia (including side effects)

15. Which anaesthesia method do you prefer?
 - a. General anaesthesia
 - b. Regional anaesthesia