



## Use of Social Networks by Patients Submitted to Elective Surgical Procedures: An Observational Study

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### Abstract

**Objective:** Social networks present continuous growth worldwide. Patients have explored these platforms for purposes of communication on health, which makes possible to get to know professionals and services, in addition to interacting with other patients and physicians. The present study aims at outlining the profile of patients that use social networks to search about surgical procedures, surgeons, and anesthesiologists. It also intends to identify the main platforms used and what patients would like to find in their searches.

**Methods:** An observational, cross-sectional study was conducted that interviewed 200 volunteers submitted to elective surgical procedures. Individuals that reported to not have access to the internet or social media, or that did not answer important questions were excluded, which resulted in a final sample with 87 subjects. Collection of identification data and medical information was made, and subjects were questioned about having or not searched about the surgeon and anesthesiologist on social networks.

**Results:** Female patients who underwent aesthetic procedures present higher tendency to search about the surgeon on social networks and other websites. The most used social media was Instagram, and the most used website was Google. Regarding anesthesiologists, only 3% of participants searched the professionals on social media.

**Conclusion:** The benefits provided by social networks and their impact are increasingly evident, including in health communications, thus leading to dissemination of information, and strengthening of the doctor-patient relationship. It is worth reminding the importance of the ethical stance of physicians on social networks and in the production of reliable contents to patients.

**Keywords:** Internet; Health communication; Surgery

### Introduction

Social networks are defined as Internet-based applications that allow two-way and direct communication, including instantly creation and sharing of contents and information [1]. Their use has continuously increased all over the world and has changed the way people acquire information. In 2021, in the United States of America, seven out of ten people used at least once one of these platforms [2].

A growing number of patients are exploring social networks and other online platforms to obtain health information and connect to other patients and physicians [3].

This fact is due to the networks capacity to reach large part of the population, regardless of their socioeconomic characteristics [4], and enable interconnectivity across individuals and easy sharing of information [5,6].

Several reasons lead to this growth and popularity of networks. With them, it is possible to obtain information on health and diseases, compare different health services and professionals, establish social support among patients, and improve the doctor-patient relationship [7-9].

These advantages are also extended to surgical procedures, where social networks can assume the role of informing and guiding patients from the preoperative period to the postoperative period [10].

However, today there is need of studies on the relation of the use of social networks and surgical procedures. This investigation intends to outline the profile of patients that use these platforms

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to search the subject. Furthermore, the study aims at identifying the main networks used for this search and the information patients would like to find.

## Materials and Methods

### Study design

The present paper describes an observational, cross-sectional study. Interviews were made with 200 volunteers submitted to elective surgical procedures in a private hospital in the North region of Rio Grande do Sul. Participants were informed about the study and later invited to answer to the questionnaire anonymously and voluntarily. All participants were evaluated before surgery by the surgeon and the anesthesiologist. Of the 200, 113 did not appropriately answer the questionnaire, or reported to not have access to the internet or social media. The resulting sample, therefore, included 87 volunteers.

### Data collection

Data were collected from June 2021 to September 2022 through a questionnaire about search by the volunteers, on social networks, about the surgeon, the anesthesiologist, and the surgical procedure. Identification data were collected (age, sex, and level of education), the procedure made, presence or not of comorbidities, and level of anxiety reported by the individual. The participant was questioned whether he/she searched about the surgeon and anesthesiologist on social networks or other digital media, and, if yes, the platform used. It was also asked about the information considered important to find (Table 1). The main goal was to establish the profile of the patient that tends to make this search for information more forcefully.

### Ethical aspects

The research project that entailed this paper was submitted to the Research Ethics Committee (CEP) of the Integrated Regional University of Alto Uruguai and Missões (URI), according to resolution N° 510/16 of the National Health Council and was approved with opinion N° 4.630.225 (CAAE 43139821.2.0000.5351) and all participants agreed to voluntarily participate in the study, with their rights preserved, and guarantee of full secrecy of information.

### Data analysis

To compare volunteers' anxiety score average regarding having or not searched on social networks about the surgeon, Mann-Whitney test was adopted. To determine association among variables, Chi-square test or Fisher's exact test was used. Multiple Correspondence Analysis (MCA) was also performed using the package FactoMineR® [11], because it enables the analysis of qualitative data and viewing possible relations across variables. Statistically significant results were considered for values of  $p < 0.05$ . Analyses were performed using software GraphPad Prism 9.2® and R Studio®.

## Results

The final sample of the present study presented 87 participants, 65 of them female (74.71%) and 22 male (25.29%). As to age, the average obtained was  $41.13 \pm 12.14$  years, minimum age 18 years, and maximum age 65 years. About level of education, 9.2% reported level 1, which includes people with incomplete primary education, 8.05% with level 2, including individuals with complete elementary school and incomplete high school, 40.23% reported to have level 3, that is, complete high school or incomplete higher education, and finally, 42.53% informed level 4, or complete higher education.

The relation of the study variables and the fact that the participant

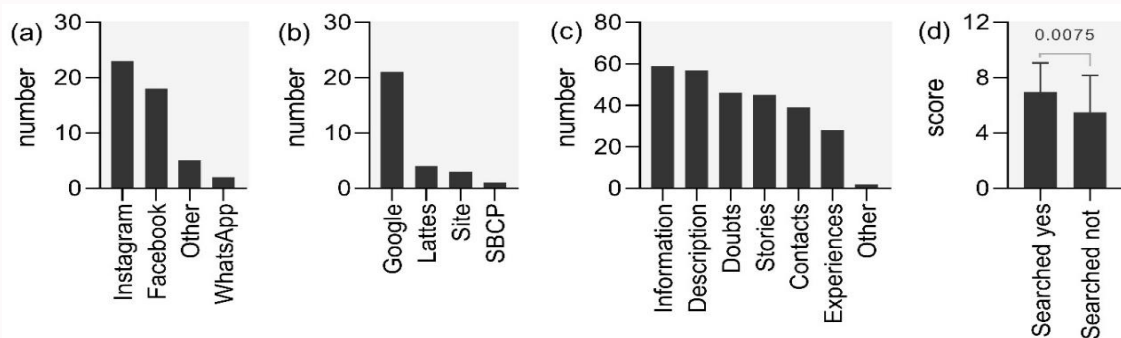
**Table 1:** Final set of questions used to identify the use of social media and other platforms by volunteers in the search for information on surgeons and anesthesiologists.

<b>General information:</b>
Age
Sex
Level of education
Type of surgical procedure made
Comorbidities
Do you call yourself an anxious person?
In a scale from 0 to 10, what is your level of anxiety regarding the procedure?
<b>About the surgeon:</b>
Did you search on the surgeon's social media? If so, which platform?
Did you search on any other website? Which?
Do you think that the surgeon having social networks is important?
What information would you like to find?
<b>About the anesthesiologist:</b>
Did you search on the anesthesiologist's social media? If so, which platform?
Did you search on any other website? Which?
Do you think that the anesthesiologist having social networks is important?
What information would you like to find?

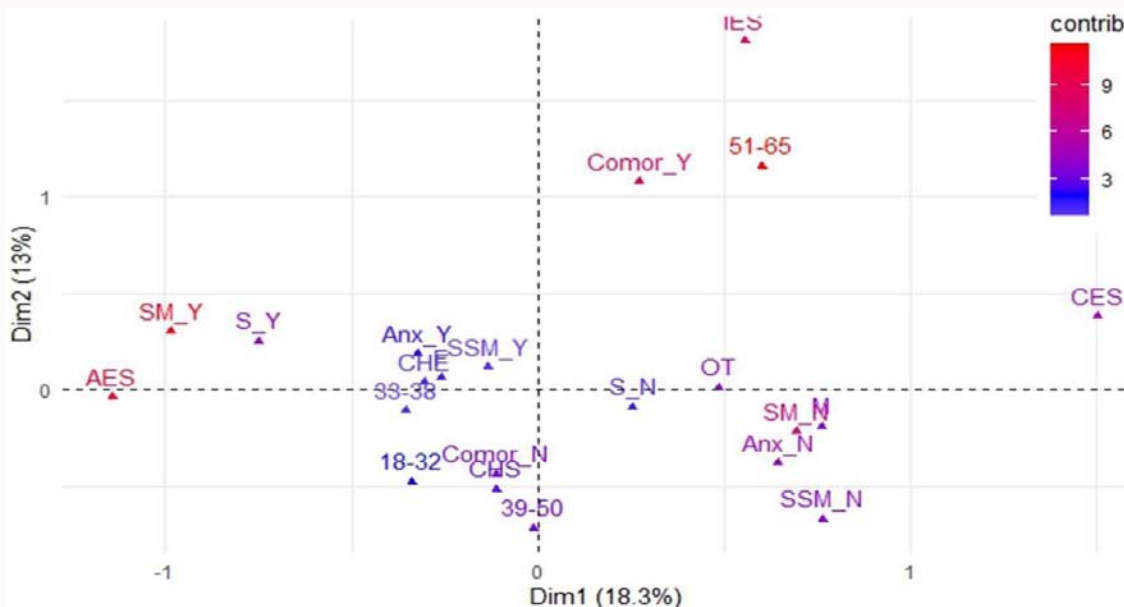
**Table 2:** Chi-square ( $\chi^2$ ) test and p values for categorical variables according to the fact of having or not searched on the surgeon on social networks.

Categorical variables	Did you search about the surgeon on social networks?		p value
	Yes	No	
<b>Sex</b>			
Female	31	34	0.04
Male	5	17	
<b>Age group</b>			
18-32	10	11	0.844
33-38	9	11	
39-50	8	14	
51-65	9	15	
<b>Aesthetic</b>			
procedure	23	3	<0.001
Not aesthetic	13	48	
<b>Comorbidities</b>			
Yes	10	15	0.868
No	26	36	
<b>Anxiety</b>			
Yes	29	29	0.021
No	7	22	
<b>Finds important</b>			
Yes	36	38	0.001
No	0	13	

searched or not about the surgeon on social networks was analyzed and represented on Table 2. Variables sex, type of procedure, anxiety and level of importance presented significant association with the search about the medical services in social networks ( $p < 0.050$ ). Women that



**Figure 1:** (a) Social networks used (Instagram; Facebook; WhatsApp; Other social media). (b) Other websites used (Google; Lattes= academic curriculum; Site= professional site; SBCP= Brazilian Society of Plastic Surgery). (c) Information patients would like to find on surgeons' social networks (Information= information on the professional training and specialization; Description= explanations about surgeries and procedures made; Doubts= clarification of frequent doubts; Stories= reports from other patients; Contacts= contact data; Experiences= professional experiences; Other= other information). (d) Level of preoperative anxiety in patients that searched (Searched yes) or did not search (Searched not) the surgeon's social networks.



**Figure 2:** Map obtained through MCA of the following variables: fact of having searched about the surgeon on social networks (SM\_Y= searched; SM\_N= did not search), fact of having searched about the surgeon on other websites (S\_Y= searched; S\_N= did not search), presence of comorbidities (comor\_Y= presence of comorbidities; comor\_N= No comorbidities), type of procedure (AES= Aesthetic procedure; OT= Other Type of procedure), level of education (IES= Incomplete Elementary School; CES= Complete Elementary School; CHS= Complete High School; CHE= Complete Higher Education), anxiety (Anx\_Y= finds himself anxious; Anx\_N= does not find himself anxious), level of anxiety (>5= in scale 0 to 10, refers to level of anxiety higher than 5; ≤ 5= in scale 0 to 10, refers to level of anxiety lower or equal to 5), age group (18-32; 33-38; 39-50; 51-65), fact of considering important the surgeon having social networks (SSM\_Y= considers important; SSM\_N= does not consider important). The two dimensions explain 18.3+13% of data variation. Variables in red and in blue present the higher and lower contributions, respectively. The proximity of variables in the diagram confirms higher relation among them.

underwent aesthetic surgeries, consider themselves anxious, and find it important that the physician has social networks demonstrated higher interest in searching about them on these platforms.

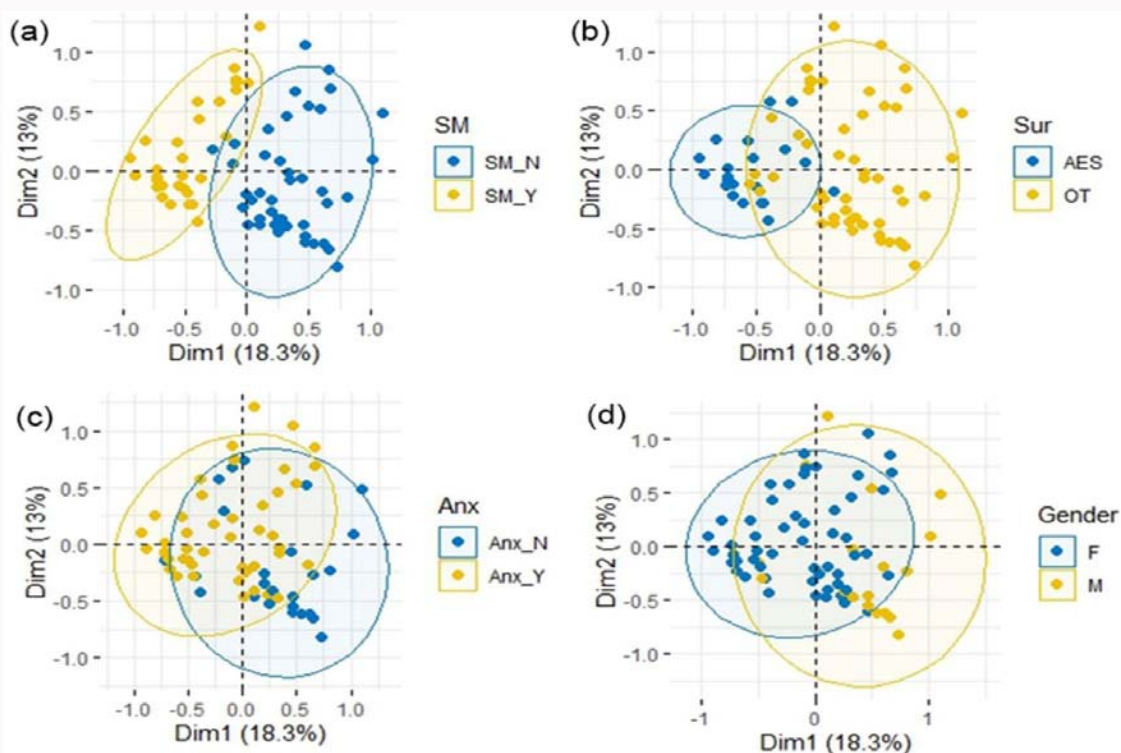
36 patients stated to have searched about the surgeon on social networks, 23 used Instagram, the social network most used by participants in this study. The second most used social network was Facebook, mentioned by 18 volunteers (Figure 1A). Among the 22 participants that reported to have used a website as source of information, Google was the main tool used, with 21 answers, followed by academic curriculum available at Lattes platform, with 4 answers (Figure 1B).

From a total of 87 volunteers, 85% considered important the surgeon having social networks. And when questioned about

the information they would like to find, the main answers were “information on the professional training and specialization”, and “explanations about the surgeries and procedures made”, with 59 and 57 answers, respectively (Figure 1C). Moreover, around 86% stated to feel safer with such information.

A comparative analysis was also made between the level of anxiety reported by volunteers before the surgical procedure and the fact of having or not searched the surgeon networks. A tendency of higher level of anxiety was presented among volunteers that stated to have made such search, with p value of 0.0075 for comparing the anxiety scores between the two groups (Figure 1D).

Based on the multiple correspondence analyses of variables (Figure 2), one can observe proximity of variables “aesthetic surgery”,



**Figure 3:** Graphs of Multiple Correspondence Analysis (MCA) for qualitative variables. Each point represents one volunteer. Groupings were generated by answers of the same category based on: (a) having or not searched about the surgeon on social networks ('SMM'), (b) type of procedure made ('Sur'), (c) whether or not the person considers himself as Anxious ('Anx') and (d) Gender ('Gender').

“search on social networks”, and “search on websites”, at the left of the diagram, which confirms association among them. On the other hand, at the right of the diagram variables “other types of procedure”, “male sex”, “did not search on social networks”, and “denies being anxious” are represented.

It is also possible, with MCA, to represent each volunteer in diagrams, to analyze the proximity of their answers and those of the other individuals (Figure 3). Figure 3a shows, on the left of the diagram, volunteers that stated to have searched about the surgeon on social networks, and those that did not search on the right. Figures 3b-3d, show on the right volunteers that underwent aesthetic procedure, find themselves anxious, and are women.

These presentations show that female volunteers, anxious, and that underwent aesthetic surgeries presented higher tendency to search about the surgeon on social networks and other websites. Male participants that underwent other types of surgical procedures, deny being anxious, and don't consider important the professional having social networks, on the other hand, represent a profile of volunteer that is not used to seek information on the surgeon on digital platforms.

In this study, the participants interviewed were also questioned about the anesthesiologist. In this regard, only 3% of participants stated to have searched on the professional's social networks, while 4% searched information on the doctor using Google. Despite that, around 70% of participants believe to be important the use of social networks by the professional for information purposes.

## Discussion

The findings in this study enable to outline the profile of the

volunteer that searches most on social networks before a surgical procedure. It may be observed that female patients, who find themselves anxious and will undergo aesthetic procedure tend to seek more information on networks than the other patients. The perception of female sex prevalence on social network searches is partially corroborated by previous studies. High discrepancy of sexes was observed in the use of websites of medication reviews and health forums on the Web, with the number of women four times higher than that of male users [12].

There is evidence in the literature inferring that anxious patients explore, more frequently, the internet searching for information on the procedures they will undergo. A study conducted by Meira [13] that investigated presence of anxiety in patients submitted to invasive diagnostic procedures concluded that higher anxiety scores are directly associated to the difficulty of finding information on the internet, or the reliability of such information. It also reported that patients that proactively searched such information demonstrated lower degree of anxiety.

Other Brazilian study also suggested that patients with more information on the surgical procedure they are about to undergo tend to present lower levels of anxiety [14]. In these cases, social networks give opportunity to complement information provided by the physician, so that the patient will understand better the procedure.

With that, it is important to discuss about the adherence of health professionals to the use of social networks, production of information, and reliability of information. Some characteristics of social networks, like the possibility of changes at any time, global reach, immediatism, and collective construction of knowledge, including by lay users, can compromise the quality of the content available [15,16].

The quality, reliability, and misapplication of information found are factors of concern, mainly where the user is directed to choose products and services based on false information, or where such information can compromise their health [17]. However, active participation of health professionals in social networks may reduce dissemination of low-quality contents and increase reliability of information found online on-line [18].

Despite this fact, usually, generating insecurity both in patients and health professionals can be easily overcome with the ethical use of social media, keeping the patient trust, providing precise and true information, in addition to keeping appropriate limits between doctor and patient [3]. The guarantee of high-quality contents would increase adherence to social networks by health professionals and would confer higher confidence and security to patients during their online searches [19].

Based on this study results, one can indicate social networks as important means of communication in cases of aesthetic surgery. Patients attracted to these procedures have increasingly searched information on online platforms [20]. In a study with 500 patients interested in aesthetic procedures, 46% used social media to obtain information, and among them, 40% were influenced by the contents found at the time of choice of clinic and surgeon [21].

In addition to the educational role, studies consider social media as powerful marketing tools for surgeons [22,23]. Instagram, the platform most mentioned by the volunteers interviewed in this work presents growing influence and is used by many surgeons with information and commercial purposes [24].

Despite that, one should be cautious while using them, mainly regarding the patient privacy and other ethical aspects of the profession. It is worth reminding that, according to the Brazilian Federal Council of Medicine (CFM), the physician can't provide contents that characterize sensationalism, self-promotion, or unfair competition [25].

On the other hand, the search for information in this study referring to the anesthesiologist on social networks indicated only 3%, which raise questions about the volunteers' interest in information and their availability and provision. This finding may suggest that volunteers are satisfied with information provided in the pre-anesthesia consultation and it was not necessary to make more research on anesthesia social networks. Moreover, providing information on anesthetic procedures, including risks, does not seem to make patients more anxious.

However low levels of research on social media regarding anesthesia, 70% of the participants found important use of social networks to provide medical information in this field. In the realm of contemporary healthcare, the utilization of social media by anesthesiologists presents a promising avenue for enhancing patient interaction and fostering a deeper sense of trust. Through strategic engagement on platforms such as Twitter, Facebook, and LinkedIn, anesthesiologists possess the opportunity to connect with patients on a more personal level, offering insights into the intricacies of anesthesia procedures and addressing common apprehensions. By disseminating accurate information and sharing success stories, these professionals can effectively mitigate patient fears surrounding anesthesia, ultimately contributing to a more informed and confident healthcare consumer base. Moreover, active participation in online discourse serves to elevate the visibility and prestige of the

anesthesiology discipline, thereby cultivating greater appreciation and understanding within the broader populace. As such, the judicious use of social media platforms by anesthesiologists could be a tool that not only facilitates improved patient experiences but also contributes to the advancement and recognition of this vital medical specialty [26].

One of the limitations of our study is its narrow scope, which primarily reflects the local context. Consequently, our findings may not be generalizable to broader populations or contexts. Therefore, further research is warranted to gain a comprehensive understanding of the subject matter.

## Conclusion

The benefits provided by social networks and their impacts are increasingly evident. Regarding communication on health, they allow the easy and fast dissemination of information, communication among patients, and strengthening of doctor-patient relationship. Data show that some profiles of patients are more likely to search on these platforms' information about surgeons and procedures. On the other hand, those interviewed searched little about the anesthesiologist.

The study results also led to the reflection about the importance of ethical and cautious stance by physicians while using social networks and producing reliable contents to patients. Finally, new studies can deepen the relation between the use of social networks and surgical procedures, understanding much more what patients seek and how to better explore this search.

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