



Research Paper

Factors influencing decisions among the public related to the chosen surgeons for elective surgeries: A nationwide study



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ABSTRACT

Aim: It is a complex decision for patients and their families to select a qualified surgeon who meets their needs. Understanding these needs enables surgeons to build stronger relationship with patients. This study aimed to identify influencing factors, variables, and criteria that individuals consider when selecting surgeons for elective surgeries.

Methods: This is a nationwide cross-sectional study conducted among patients who have undergone elective surgeries in Saudi Arabia. The data were collected with an anonymous self-administered pre-validated questionnaire. The collection of data was carried out through web-based questionnaires using google forms. The questionnaire contains socio-demographic characteristics (i.e., age, gender, education, etc.) and different factors to assess patients' perceptions in choosing a surgeon.

Result: Patients' overall number was 3133 (56.2 % females vs 43.8 % males). The most common age group was 18 to 34 years old (63.7 %). The prevalence of patients who were able to choose the right surgeon to perform an operation was 79.8 %. Patients' top choice when selecting a surgeon was according to the surgeon's manner followed by the qualifications then the reputation. Females are choosing a surgeon according to his/her manner while males are choosing according to his/her qualifications.

Conclusion: Surgeons' manner and qualifications are the most considered factors among when selecting a surgeon while the realistic factors such as accreditation of a facility and surgeon's scientific roles, quality improvement, and patient safety are ignored among the public. This requires condensed educational efforts and further research to determine the advertisements and social media effects on patients' decisions related to their health.

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Background

Surgery has a significant role in treating a variety of diseases. A broad spectrum of diseases affects different age groups, starting from congenital anomalies in pediatrics to cataracts in the elderly treated through surgical interventions. In addition, numerous conditions require surgical care in different aspects, like accurate diagnosis and comprehensive perioperative care. Nowadays, surgical care is acknowledged as a fundamental component of the health care system [1]. According to the

Lancet's global burden of disease (GBD) report, surgical diseases account for 11 % to 25 % of the GBD, with 234 million surgical procedures performed globally each year [2]. Therefore, patients with surgical diseases have to select a qualified surgeon even though it is a complex decision [3]. Nevertheless, choosing a healthcare provider is a highly consequential process, and patients' decisions are influenced by a complex interaction between diverse patient and provider factors such as access to care, surgeon's manners, board certification, and office appearance. Also, gender could be an important factor as reported in the literature [4–8].

Numerous studies have looked at how patients choose health care providers, hospitals, and health plans. In a study of 600 participants, Bornstein et al. found that choosing a primary care physician was influenced by factors related to a physician's expertise, such as board certification and professional skills. [9] Yahanda AT et al. highlight certain barriers to patient decision-making, like access to accurate,

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easily understood information [10]. These studies demonstrate that different patients may choose a primary physician based on different criteria and that some patients may place varying levels of value on certain variables. On the other hand, some patients who are planning on having surgery might not give these extra-clinical variables any consideration. A surgeon often has a short relationship with a patient, in contrast to a family doctor who is involved in the long-term care of patients and their families. As a result, few patients could choose a surgeon based on their surgical expertise. [11]

Up to our knowledge, there are deficient studies about the determinants of patient choose surgeons or hospitals for surgery in Saudi Arabia. Understanding these factors will help to understand the patient's needs and what they are looking for. Therefore, this study aims to identify the factors the patient considers when selecting a surgeon for surgery compared to previous studies.

Methodology

Study design and setting. This nationwide cross-sectional study was conducted from January 1st to June 30, 2022, in all 13 administrative regions of Saudi Arabia. The included participants were adult males and females who gave their permission to be part of this study. Below the age of consent, any person suffering from a mental illness that makes them unable to decide for themselves, and those who did not give their consent were excluded. The study followed the principles of the Declaration of Helsinki.

Sampling technique, data collection method, instrument used. This study was conducted through an electronic self-administered questionnaire extended and distributed randomly to various regions via data collector, to determine factors that patients or beneficiaries of health services take into account when they research and choose a surgeon) to perform elective operations in Saudi Arabia. The survey was adapted and modified from a validated questionnaire used to assess Factors That Influence Patients' Selection for Elective surgery. The questionnaire comprised two sections: demographic data, and factors that could influence patients' selection of a surgeon for elective surgery.

The questionnaire. Questions were written with further explanations that help the participant to understand any phrase or sentence. The used terminology that required further explanation were those of importance in our assessment and analysis. All questions of statistical importance were the following:

Statistical analysis

Descriptive statistics were used to define the proportion of responses for each variable. Values were computed and reported as numbers, percentages, mean and standard deviation as applied. The comparison between the preference in choosing the surgeon according to age, gender, and region had been performed using Mann Whitney Z-test and Kruskal Wallis H-test. Normality test was performed using Shapiro Wilk test as well as Kolmogorov-Smirnov test. All factor scores follow non-normal distribution; therefore, non-parametric tests were applied between comparisons. Statistical significance was identified at $p < 0.05$. The data analyses were performed using Statistical Packages for Software Sciences (SPSS) version 26, Armonk, New York, IBM Corporation.

Ethical considerations

The study was approved by the institutional review board (IRB) of Imam Mohammad Ibn Saud Islamic University and was carried out in accordance with the IRB's standards. All participants were informed about the study's objectives, and their consent was obtained. All responses from this study would be kept strictly confidential, with only the study's authors having full access, and all participant information would be kept in strict confidence.

Table 1
Socio-demographic characteristics of the patients^(n = 3133).

Study Data	N (%)
Age group	
18–34 years	1996 (63.7 %)
35–44 years	616 (19.7 %)
45–54 years	373 (11.9 %)
55–64 years	120 (03.8 %)
≥ 65 years	28 (0.90 %)
Gender	
Male	1371 (43.8 %)
Female	1762 (56.2 %)
Educational level	
Primary or secondary school	57 (01.8 %)
High school or diploma	788 (25.2 %)
Bachelor's degree	2016 (64.3 %)
Master or PhD degree	272 (08.7 %)
Occupational status	
Student	1079 (34.4 %)
Employed	1305 (41.7 %)
Unemployed	507 (16.2 %)
Retired	242 (07.7 %)
Economic Status Level	
Low	421 (13.4 %)
Middle	2277 (72.7 %)
High	435 (13.9 %)
Geographic Region of Residence	
Central Region	888 (28.3 %)
Eastern Region	679 (21.7 %)
Western Region	706 (22.5 %)
Southern Region	429 (13.7 %)
Northern Region	431 (13.8 %)
Able to choose the right surgeon to perform an operation	
Yes	2500 (79.8 %)
No	633 (20.2 %)
The choice of surgeon has an important impact on the outcome of the surgery	
Strongly disagree	29 (0.90 %)
Disagree	102 (03.3 %)
Neutral	304 (09.7 %)
Agree	1269 (40.5 %)
Strongly agree	1429 (45.6 %)

Results

In total, 3133 patients responded to our survey. **Table 1** presented the socio-demographic characteristics of the patients. 63.7 % were aged between 18 and 34 years old with more than half (56.2 %) being females. With regards to education, 64.3 % had bachelor's degrees while 41.7 % were employed. With respect to economic status, 72.7 % were middle economic status. Patients who were living in the Central region constituted 28.3 %. The proportion of patients who were able to determine the right surgeon to perform the operation was 79.8 %. Additionally, almost 85 % of participants believed that their choices of surgeons have an important impact on the outcome of their planned surgeries.

In **Fig. 1**, the most preferred qualification that must be available for a surgeon was various experiences (23.5 %), followed by surgical ability (18.3 %) and attitudes (13.8 %).

In **Fig. 2**, 23.5 % strongly agreed that the presence of a surgeon's account or advertisement on social media and a high number of followers and fans can be considered positive attributes for the surgeon and 50.1 % strongly agreed that it is important to search for information about the surgeon from difference sources, like fellow surgeons, previous patients, or social media which may eventually the guide for choosing the right surgeon.

The assessment of factors taken by patients in choosing a surgeon were given in **Table 2**. For the surgeon reputation domain, the mean score was highest in the statement “Surgeon's reputation and his biography are important and affect the decision to choose the surgeon” (mean score: 4.65; SD 0.64). The total mean score for the surgeon reputation domain was 4.24 (SD 0.57). For the surgeon manner domain,

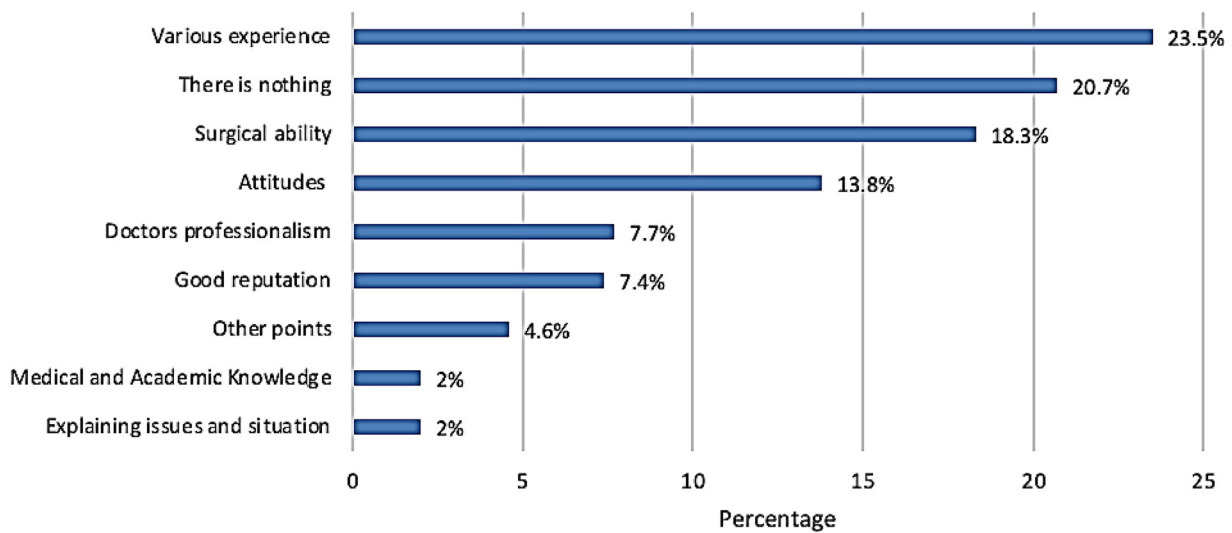


Fig. 1. Specific qualifications that must be available for a surgeon.

the mean score was highest in the statement “The surgeon discusses issues in a way that I can understand” (mean score: 4.59; SD 0.66) and the total mean score of the surgeon manner domain was 4.58 (SD 0.53). For the surgeon quality information domain, the mean score was higher in the statement “His interests in the quality of medical care are important and influence the decision to choose a surgeon” (mean score: 4.50; SD 0.72), the total mean score of surgeon quality information was 4.32 (SD 0.59). For the surgeon qualifications domain, the mean score was higher in the statement “The surgeon’s qualifications and academic work are important and affect the decision to choose a surgeon” (mean score: 4.43; SD 0.76) and the total mean score for surgeon qualification was 4.10 (SD 0.69). For the hospital domain, the mean score was highest in the statement “The hospital has a good reputation among patients and doctors” (mean score: 4.39; SD 0.75) and the total mean score for the hospital domain was 4.18 (SD 0.75). For the customer service domain, the mean score was highest in the statement “The ease of scheduling an appointment with the surgeon”, the total mean score of the customer service domain was 4.19 (SD 0.78). Finally, for the domain of the non-clinical feature, the mean score was highest in the statement “The financial aspect and costs have an impact on the decision to choose a doctor for the surgery” (mean score: 4.39; SD 0.80)

and the total mean score for non-clinical features domain was 4.11 (SD 0.74).

In Fig. 3, it was revealed that the surgeon manner domain was the top choice of the patients to be considered in choosing the right surgeon (mean score: 4.58), followed by the surgeon quality of information domain (mean score: 4.32) and surgeon reputation domain (mean score: 4.24) while surgeons’ qualification was the least choice (mean score: 4.1).

In Table 3, it compares the patient’s preference in choosing a surgeon according to the age group, it can be observed that the older age group (≥ 35 years) was more associated with a higher mean score in the surgeon reputation domain ($Z = 3.828; p < 0.001$), surgeons qualifications domain ($Z = 5.013; p < 0.001$) and hospital domain ($Z = 2.096; p = 0.036$).

When comparing the patients’ preferences in choosing a surgeon in relation to gender (Table 4), it was found that females were more associated with a higher mean score in surgeon’s manner ($Z = 2.840; p = 0.005$), however, males were more associated with a higher mean score in surgeon’s qualifications ($Z = 3.294; p = 0.001$).

When measuring regional differences in the preferences in choosing a surgeon (Table 5), it was observed that patients living in the Central

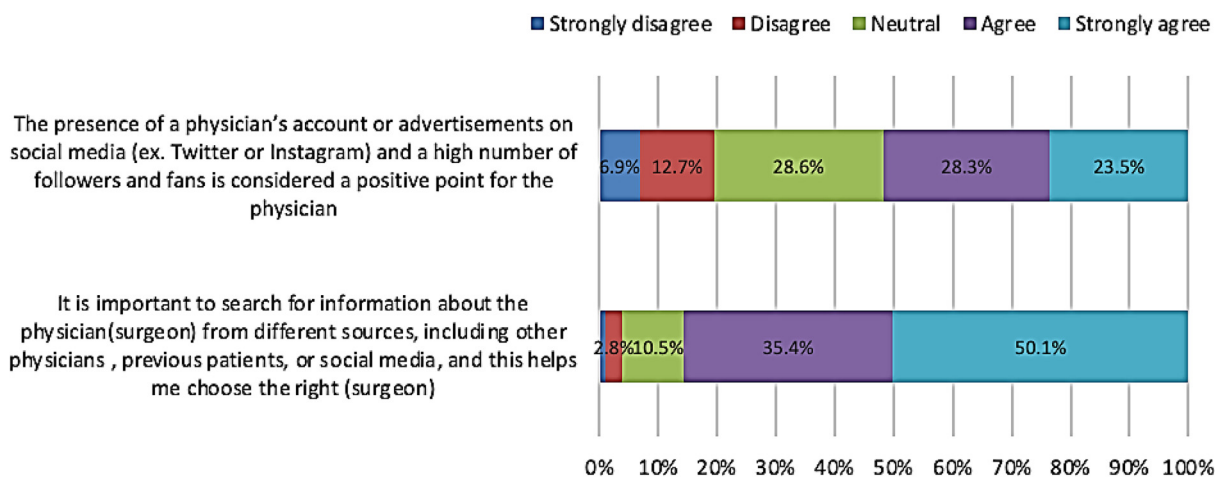


Fig. 2. Impact of social media on choosing the right surgeon.

Table 2
Factors taken by patients when choosing their surgeons⁽ⁿ⁼³¹³³⁾.

Statement	Mean ± SD
The role of the reputation and popularity of the surgeon	4.24 ± 0.57
Surgeon's reputation and popularity in society are important and affect the decision to choose the surgeon	4.65 ± 0.64
My primary doctor recommendation	4.16 ± 0.82
How patients rated the surgeon in a survey	4.39 ± 0.73
Surgeon's reputation within the medical and academic field (known to other surgeons)	4.29 ± 0.82
Depending on the surgeon's popularity on social media platforms (ex. Twitter and Instagram)	3.70 ± 1.12
The role of surgeon's manner and his/her interpersonal and communication skills	4.58 ± 0.53
Surgeon's way in dealing patients is important and affects the decision to choose a surgeon	4.58 ± 0.66
The surgeon spends adequate time with patients to answer their questions	4.57 ± 0.64
The surgeon discusses issues in an understandable language and uncomplicated way	4.59 ± 0.66
The surgeon follows up patients and see them himself after the surgery	4.57 ± 0.68
The surgeon is honest about potential operative complications	4.57 ± 0.69
The role of surgeon's interests in Quality Improvement and patient safety efforts	4.32 ± 0.59
Surgeon's interests in quality improvement and patient safety are important and influence the decision to choose a surgeon	4.50 ± 0.72
The surgeon follows the updated guidelines and is adherent to patient safety principles	4.46 ± 0.71
How often the surgeon performs the procedure compared to his/her peers	4.29 ± 0.82
His contributions to awareness, quality assurance, and patient safety conferences	4.20 ± 0.86
Surgeon's records of cases that had unexpected surgical complications	4.14 ± 0.89
The role of surgeon's academic and clinical skills qualifications	4.10 ± 0.69
The surgeon's qualifications are important and affect the decision to choose a surgeon	4.43 ± 0.76
The number of years the surgeon has been in practice	4.43 ± 0.74
The surgeon's interests and participation in medical research	4.06 ± 0.92
The medical school attended by the surgeon	3.83 ± 1.06
The clinical training (residency, fellowship) completed by the surgeon	3.99 ± 0.98
The surgeon has an academic position for medical students or junior surgeons training	3.88 ± 1.03
The role of the hospital where the surgeon is performing the procedure	4.18 ± 0.63
The hospital where the surgeon works is important and affects the decision to choose the surgeon	4.23 ± 0.85
Hospital capabilities (number of beds and availability of other departments)	4.25 ± 0.82
The hospital is affiliated with a medical school	3.91 ± 0.96
The hospital has a good reputation among patients and doctors	4.39 ± 0.75
The surgeon works in a known government hospital	4.15 ± 0.88
The surgeon works in more than one hospital	4.10 ± 0.93
Customer Service	4.19 ± 0.66
Administrative process and patient services are important and affect the decision to choose a surgeon	4.22 ± 0.86
The ease of scheduling an appointment with the surgeon	4.31 ± 0.78
The friendliness and availability of the surgeon's office staff	4.23 ± 0.85
Surgeon's appearance and elegance	3.97 ± 0.97
How long you must wait to get an appointment with the surgeon	4.17 ± 0.86
The appearance and environment of the office	4.15 ± 0.87
Ease of changing appointments and communicating with the surgeon	4.29 ± 0.81
The location of the clinic or hospital is suitable for patients, and they can reach them easily	4.17 ± 0.89
Nonclinical Features	4.11 ± 0.74
The cost has an impact on the decision to choose a surgeon for the surgery	4.39 ± 0.80
The high cost (compared to others in the same place) indicates its distinguished level	3.77 ± 1.19
Surgeon's ability to help patients (request for discount)	4.23 ± 0.85
The required surgery is included within the announced offers or discounts by the clinic or hospital	4.05 ± 0.97

region showed significantly fewer scores in the surgeon's reputation domain ($H = 22.778$; $p < 0.001$) while patients living in the Southern region exhibited significantly fewer scores in surgeon manner domain ($H = 33.111$; $p < 0.001$), surgeon quality of information domain

($H = 21.981$; $p < 0.001$) and hospital domain ($H = 9.646$; $p = 0.047$). However, patients living in the Southern region showed an increased score in the domain of the non-clinical feature ($H = 11.899$; $p = 0.018$).

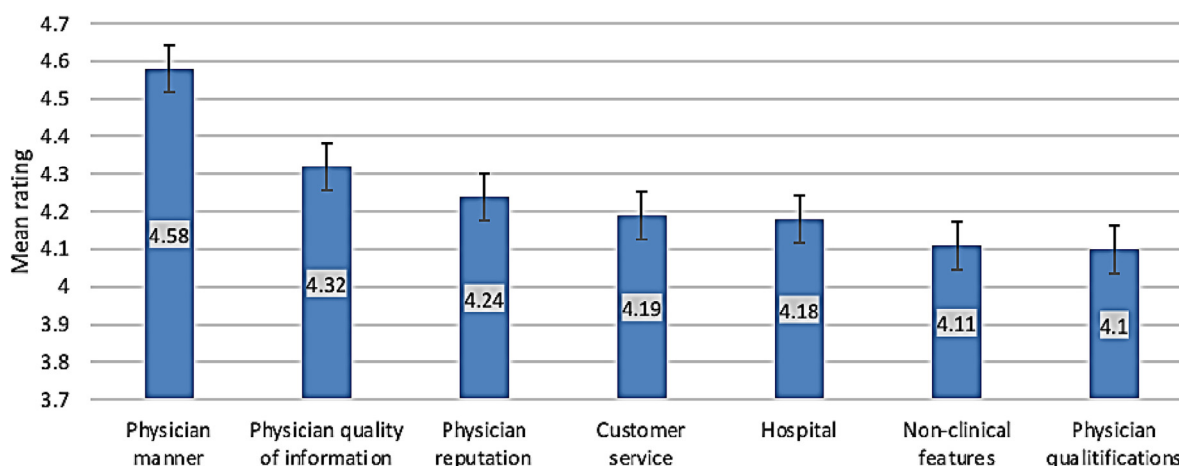


Fig. 3. Overall mean ratings for the factors taken by patients in choosing the right surgeon.

Table 3
Comparison of patients' preference in choosing a surgeon according to age (n=3133).

Factor	<35 years Mean ± SD	≥35 years Mean ± SD	Z-test	p-value [§]
Surgeon reputation	4.21 ± 0.57	4.29 ± 0.56	3.828	<0.001**
Surgeon manner	4.58 ± 0.54	4.57 ± 0.53	0.716	0.474
Surgeon quality of information	4.30 ± 0.60	4.34 ± 0.57	1.809	0.070
Surgeon qualifications	4.06 ± 0.71	4.18 ± 0.68	5.013	<0.001**
Hospital	4.17 ± 0.63	4.21 ± 0.63	2.096	0.036**
Customer service	4.19 ± 0.67	4.17 ± 0.65	1.301	0.193
Non-clinical features	4.09 ± 0.74	4.13 ± 0.74	1.327	0.185

[§] P-value has been calculated using Mann Whitney Z-test.

** Significant at p < 0.05 level.

Table 4
Comparison of patients' preference in choosing a surgeon according to gender (n = 3133).

Factor	Male Mean ± SD	Female Mean ± SD	Z-test	P-value [§]
Surgeon's reputation	4.23 ± 0.59	4.25 ± 0.55	0.497	0.619
Surgeon's manner	4.54 ± 0.56	4.60 ± 0.51	2.840	0.005**
Surgeon's quality of information	4.31 ± 0.62	4.32 ± 0.57	0.533	0.594
Surgeon's qualifications	4.14 ± 0.71	4.07 ± 0.69	3.294	0.001**
Hospital	4.18 ± 0.66	4.19 ± 0.61	0.118	0.906
Customer service	4.19 ± 0.68	4.18 ± 0.65	1.147	0.251
Non-clinical features	4.10 ± 0.75	4.12 ± 0.73	0.289	0.773

[§] P-value has been calculated using Mann Whitney Z-test.

** Significant at p < 0.05 level.

Discussion

This study investigated the most principal factors to be considered by the patients when choosing a surgeon. The findings of this study revealed that the surgeon's manner and the surgeon's quality of information were the two of the most important factors in their selection of surgical providers. This is strikingly similar to that of Bozic et al. [12] Among the 251 patients who underwent elective total joint arthroplasty, the surgeon's manner, and surgeon quality of information were revealed as the most important factors in their selection of surgeon while cost-sharing was the least important criterion patients considered. Similarly, the surgeon's manner was also the most important consideration among patients who came to be evaluated for any number of operations at surgical clinics in either private or government hospitals, in Riyadh, Saudi Arabia [13]. This was followed by customer service while non-clinical features were the least important. The surgeon's manner was in fact highly regarded as the most important trait of a surgeon throughout the literature [14–21]. Although, the surgeons' qualities of being compassionate, understanding, trustworthy, and empathetic were also highly regarded by the patients as professional attributes [22–25]. Selecting a surgeon to carry out the surgery is challenging, albeit patients are rather showing coherence in their surgeon of choice.

Table 5
Comparison of patients' preferences in choosing a surgeon according to the region (n=3133).

Factor	Central Mean ± SD	Eastern Mean ± SD	Western Mean ± SD	Southern Mean ± SD	Northern Mean ± SD	H-test	P-value [§]
Surgeon reputation	4.16 ± 0.61	4.26 ± 0.52	4.29 ± 0.55	4.23 ± 0.59	4.30 ± 0.54	22.778	<0.001**
Surgeon manner	4.55 ± 0.56	4.63 ± 0.47	4.64 ± 0.48	4.44 ± 0.61	4.57 ± 0.55	33.111	<0.001**
Surgeon quality of information	4.29 ± 0.63	4.38 ± 0.52	4.35 ± 0.57	4.19 ± 0.65	4.34 ± 0.59	21.981	<0.001**
Surgeon qualifications	4.06 ± 0.73	4.12 ± 0.66	4.16 ± 0.69	4.07 ± 0.68	4.09 ± 0.71	6.739	0.150
Hospital	4.17 ± 0.68	4.23 ± 0.58	4.21 ± 0.60	4.10 ± 0.64	4.19 ± 0.63	9.646	0.047**
Customer service	4.15 ± 0.68	4.19 ± 0.64	4.24 ± 0.62	4.15 ± 0.68	4.17 ± 0.69	4.738	0.318
Non-clinical features	4.06 ± 0.75	4.12 ± 0.74	4.16 ± 0.71	4.19 ± 0.72	4.04 ± 0.78	11.899	0.018**

[§] P-value has been calculated using Kruskal Wallis H-test.

** Significant at p < 0.05 level.

In a study conducted in the United States [3], the competencies of the provider came as the top most relevant feature of decision-making. Pragmatic issues, such as the location of the facilities or ease of obtaining an appointment were of secondary importance. Our study seems to support this theory, surgeon's reputation and customer service came as the third and fourth most prominent factors in choosing a surgeon. Our patients relied on the recommendation given by their family surgeons or how other patients rated them while the ease of getting appointments and direct access to the surgeons also plays a big role in consideration. This concurred with the systematic review done by Yahanda et al. [10], which reported that the reputation of the surgeon came as the top choice for professional attributes, however, many patients also relied on surgical care using a hospital, rather than surgeon characteristics. For these, patients tend to look for hospital reputation and hospital distance as the factors of primary importance. The hospital facility was also another factor being considered by our patients, specifically those in the older age group (≥35 years), where they considered the hospital's reputation before making a decision, however, patients living in the Southern region were less likely to consider this as they are more on financial aspects rather than hospital reputations.

In Turkey [26], a survey carried out among 200 patients showed that a surgeon's attitude was the factor most significantly contributed to surgeon selection while reputation or professional experience came as the second and third choices. In our study, however, surgeons' qualifications were the least choice among our patients and there was a gender difference in consideration of this factor, where male patients were more likely to consider surgeon's qualifications in making decisions than females did. They also do consider surgeons' years in practice as well as their academic work when making final decisions. In the Western region of KSA [27], hospital accreditation was the least important criterion for patients' choices. They further explained that females rated waiting time and affordability of the hospital better than males did whereas males rated hospital accreditation and facilities more than females did. More information on how patients choose surgeons or hospitals will guide providers and assist patients in finding their preferred caregivers.

Social media plays a significant role in patients' decisions. In this study, 48.8% of the patients "agreed" or "strongly agreed" that those social media advertisements and a great number of followers would be good attributes for surgeons. Furthermore, 85.5% "agreed" or "strongly agreed" that the information coming from different sources (i.e. other surgeons, previous patients, or social media) might help them to choose the right surgeon. Consistent with these findings, Aydin and Gokcen, noted that the social media presence of the surgeon was one of the leading factors that contributed to surgeons' selection by patients. Notwithstanding, surgeon selection was considered to be of penultimate account in the treatment outcome by 95.5 % of the patients while gathering information about the surgeon before contacting her/him was considered necessary and actually performed for the current admission by 74 % of patients [26].

Conversely, aside from the myriad of factors when choosing a surgeon, patients also look for a specific qualification attributed to a

surgeon. For example, 23.5 % said that various experience of a surgeon is a positive point, 18.3 % said it is about surgical ability and 13.8 % said it is about the surgeon's attitude. Other professional attributes that should be available to the surgeon were; the doctor's professionalism (7.7 %), a good reputation (7.4%), medical and academic knowledge (2 %), and doctor's good explanation related to health issues and situations. These views are in accordance with that of Yahanda et al. [10] Patients were shown interest in quality information on surgeons, suggesting that these data would be useful in decision-making which was also similarly reported by Bozic et al. [12] Additional information about the surgeon is imperative in the selection process for patients' decision-making.

Conclusion

Surgeons' manner and qualifications were the most prominent considerations among the public when selecting surgeons for elective surgeries. Surgeons' manner and interpersonal skills are more considered among females while males tend to choose surgeons based on qualifications. Surprisingly, important and realistic factors such as accreditation of a facility and surgeon's scientific participations as well as efforts related to quality improvement and patient safety are ignored among the public which require more condensed health educational efforts and further research to determine the real effect of advertisements and social media on patients' decisions related to choosing their surgeons.

CRediT authorship contribution statement

All authors certify that they have direct and substantial contribution to the work reported in the manuscript by participating in each of the following:

1. Conception and design of the study
2. Data collection, analysis, and interpretation of data
3. Drafting the article and revising it critically for important intellectual content
4. Approving the final version of the manuscript

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Ethical approval (IRB approval)

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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