



ORIGINAL ARTICLE

# Information on the Internet Regarding Orthognathic Surgery in Turkey: Is It an Adequate Guide for Potential Patients?

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Cite this article as: Canigür Bavbek N, Baloş Tuncer B. Information on the Internet Regarding Orthognathic Surgery in Turkey: Is It an Adequate Guide for Potential Patients? Turk J Orthod 2017; 30: 78-83.

## ABSTRACT

**Objective:** To evaluate the quality of information on websites regarding orthognathic surgery in Turkey using the DISCERN toolkit.

**Methods:** An Internet search was performed using the Google search engine with the terms "orthognathic surgery", "jaw surgery", "jaw operation", "correcting jaw surgery", and "surgery orthodontics." The first 25 websites obtained after searching for each term were evaluated. Duplicate websites, advertisements, discussion groups, links to research articles, videos, and images were not considered. The remaining websites were analyzed using the DISCERN toolkit. This toolkit is composed of 15 questions that were scored from 1 to 5. Results were calculated as mean scores, percentages, and ranges.

**Results:** Among the 36 evaluated websites, 12 (33.3%) belonged to plastic surgeons, 11 (30.6%) belonged to orthodontists, 8 (22.2%) belonged to private dental clinics, 3 (8.3%) belonged to maxillofacial surgeons, 1 (2.8%) was a professional organization website, and 1 (2.8%) belonged to a private hospital. The Turkish Orthodontic Society had the only listed professional organization website. The mean total DISCERN score was 28/75 (range: 15-48). The overall quality of information in 44.4% of the websites was low. The main problems of websites were as follows: no mention of the aims, sources, and production time of information; no links for additional sources of information; and no information for patient carers.

**Conclusion:** The quality of web-based information on orthognathic surgery was generally low. Higher quality information provided by public organizations that do not have profit concerns is required.

**Keywords:** Orthognathic surgery, internet, quality of information

## INTRODUCTION

The Internet offers a medium to share information from various resources with easy access from desktops to smartphones and without time restrictions and costs, which made it a popular source of information worldwide (1,2). Before the 2000s, the Internet was an online database of digitalized leaflets designed by companies in the hope of attracting new customers. This one-way relationship was not in favor of people using the Internet for their requirements. In the early 2000s, the Internet was shifted to a new that enabled interaction among users. As a result, people started to share reviews, comments, and more written and visual content (3). From 2000 to 2016, the number of people having access to the Internet increased by 900.4% and reached more than 3.5 billion in 2016 (4). This increasing access to the public let the Internet become a popular provider of healthcare information as well (5). A national survey conducted in the US found that 72% adult Internet users searched for health issues online (6). The same trend was seen in Turkey, and 66.3% of households having access to the Internet declared that they use the Internet for searching for online health information; this was the third most common answer in the survey (7). Healthcare providers saw the Internet as a potential medium to reach patients and now use the Internet more frequently and inform the public about specific health problems (8). This increasing demand of web-based health information resulted in thousands of sites being developed. However, discovering the right or useful information is still problematic for users (9).

The study was presented and awarded the 3<sup>rd</sup> place for Selçuk Manisalı Award for Oral Presentations About Orthognathic Surgery in 15<sup>th</sup> International Congress of Turkish Orthodontic Society, 1-5 November 2016, Antalya, Turkey.

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**Received:** 11 May 2017

**Accepted:** 9 July 2017

All those aforementioned aspects about the role of the Internet in providing health information put forward the need of regulation and quality evaluation of these websites. This phenomenon resulted in some organizations developing methods to objectively assess the quality of online health information (1). The DISCERN instrument is a toolkits reported to be a valid and a reliable method for assessing the quality of written information on treatment choices for a health problem (10-12). The instrument was first developed for published written content, but it was adapted for online information as well (8,11,12). Although rating a website using the instrument requires some subjectivity, users (patients or professionals) can distinguish whether the overall quality of a publication is high or low (10). There is a handbook in the DISCERN website explaining the terms used in the questionnaire that provides hints to users on how to rate each question and things to look for when deciding the score of a question ([www.discern.org.uk](http://www.discern.org.uk)).

Trends in health-related research on the Internet also affect the orthodontic practice. Although there are numerous websites for orthodontic treatments, they vary in format, content, quality, and sophistication levels (2). Recent research on the quality of web-based information regarding orthodontic treatment dealt with the general quality of orthodontic practice websites as well as adult orthodontics, orthodontic extractions, pain during treatment, retainers, and orthognathic surgery (1,2,5,8,11,13-17). When the increasing demand of orthognathic patients to obtain information via the Internet is considered, more questions arise about the content and quality of information available (18). To date, there are no studies reporting the quality of information available online about orthognathic surgery in Turkey. However, because of worldwide differences in language and culture, the behavior of seeking health information for populations and level of information given to different populations can vary (19). For this reason, the aim of this study was to evaluate the quality of information on websites about orthognathic surgery in Turkey using the DISCERN toolkit.

## METHODS

An Internet search was performed using the Google search engine with the terms "orthognathic surgery", "jaw surgery", "jaw operation", "correcting jaw surgery", and "surgery orthodontics" at the end of May 2016. The search was conducted in Turkish and for Turkey-based websites only. The first 25 websites obtained after searching for each term were evaluated. Before evaluating the quality, duplicate websites, advertisements, discussion groups, links to research articles, videos, and images were eliminated. One evaluator (N.C.B.), who is an orthodontist, rated the websites.

The remaining websites were analyzed by the DISCERN toolkit (20). The toolkit comprises 3 parts and 16 questions. Each question is scored from 1 to 5, where "1" indicates absolute rejection and "5" indicates total acceptance that the written information meets all criteria. The overall quality of the website was scored (1 to 5) at the end. Section 1 is composed of 8 questions evaluating the reliability of the publication. Section 2 is composed of 7 questions that are about the quality of information on treatment choices. Section 3 is composed of a single question and determines the overall quality of the website (Table 1). The evaluator visited each website, read all written information regarding orthognathic surgery following the scoring guidelines of DISCERN, and rated the questions. The results were then calculated as mean scores, percentages, and ranges.

## RESULTS

Thirty-six websites were considered for evaluation. Among them, 12 (33.3%) belonged to plastic surgeons, 11 (30.6%) belonged to orthodontists, 8 (22.2%) belonged to private dental clinics, 3 (8.3%) belonged to maxillofacial surgeons, 1 (2.8%) was a professional organization website, and 1 (2.8%) belonged to a private hospital (Table 2).

The highest number of links provided by the Google search was for "jaw surgery" (around 604,000), followed by "surgery orthodontics" (around 380,000), "jaw operation" (around 362,000), "orthognathic surgery" (around 32,000), and "correcting jaw surgery" (around 3,000). However, the most accurate results were found when the terms "orthognathic surgery" and "jaw operation" were used.

Written information about orthognathic surgery could be reached different. The information was found under the "orthodontic treatments" in 44.4% (16), "jaw surgery" in 36.1% (13), "jaw esthetics" in 13.9% (5), "craniomaxillofacial surgeries" in 2.8% (1), and "repairing surgeries" in 2.8% (1) of the evaluated websites.

Except the website of Turkish Orthodontic Society, all websites belonged to private practice owners, and users were instructed to visit their clinic for receiving further information. The finding that patient information websites governed by universities or other professional societies dealing with orthognathic surgery were not ranked in the first 25 results in the Google search was remarkable.

The mean total DISCERN score of the websites was 28/75 (range: 15-48). Only 2 websites (5.6%) gave the source of information. Overall, the quality of information in 44.4% of the websites was low (1 or 2 out of 5). When the DISCERN scores were calculated according to who owned the website and provided the information, highest scores were given to maxillofacial surgeons, followed by plastic surgeons and orthodontists (Table 3).

When the problems of websites were determined, in almost all websites, the aims, sources, and production time of information were not mentioned; the limits, duration, and need for undergoing orthodontic treatment before surgery were not clear; links for additional sources of information were not provided; the results of treatment alternatives were not put forward; and there were no additional information for patient carers.

## DISCUSSION

Sharing information through the Internet is getting more important for today's healthcare providers as it is becoming the go-to source of information for most patients. Palmer et al. (21) reported that Internet use was higher among younger orthodontists who easily adapted to this technology than their elderly colleagues. As this trend coincides with the increasing demand of patients for online information, the mode of communication between practitioners and patients has changed. In 2008, Edwards et al. (22) reported that 1% of their respondents used the Internet to find their orthodontists (6,7). However, in a recent research on orthodontic marketing and media, Nelson et al. (23) reported that social media marketing significantly increased the number of new patients in an orthodontic practice. Jorgensen (3)

**Table 1.** Questions in the DISCERN toolkit and hints provided by the organization to score the questions\*

Rate Questions 1-15 accordingly:		1	2	3	4	5
		No		Partially		Yes
<b>Hints to score the questions</b>						
<b>Section 1: Is the publication reliable?</b>						
1. Are the aims clear?	Look for a clear indication at the beginning of the publication of what it is about, what it is meant to cover, and who might find it useful.					
2. Does it achieve its aims?	Consider whether the publication provides the information it aimed to as outlined in Question-1.					
3. Is it relevant?	Consider whether the publication addresses the questions that readers might ask and recommendations and suggestions concerning treatment choices are realistic or appropriate.					
4. Is it clear what sources of information were used to compile the publication (other than the author or producer)?	Check whether the main claims or statements made about treatment choices are accompanied by a reference to the sources used as evidence. Look for a means of checking the sources used such as a bibliography/reference list of the addresses of the experts or organizations quoted.					
5. Is it clear when the information used or reported in the publication was produced?	Look for dates of the main sources of information used to compile the publication, date of any revisions of the publication (but not dates of reprinting), or date of publication (copyright date).					
6. Is it balanced or unbiased?	Look for a clear indication of whether the publication is written from a personal or objective point of view, for evidence that a range of sources of information was used to compile the publication, or for evidence of an external assessment of the publication. Be wary if the publication focuses on the advantages and disadvantages of one particular treatment choice without reference to other possible choices, the publication relies primarily on evidence from a single case, or the information presented in a sensational, emotive, or alarmist way.					
7. Does it provide details of additional sources of support and information?	Look for suggestions for further reading or for details of other organizations providing advice and information about the condition and treatment choices.					
8. Does it refer to areas of uncertainty?	Look for discussion of the gaps in knowledge or differences in expert opinion concerning treatment choices. Be wary if the publication implies that a treatment choice affects everyone in the same way.					
<b>Section 2: How good is the quality of information on treatment choices?</b>						
9. Does it describe how each treatment works?	Look for a description of how a treatment acts on the body to achieve its effects.					
10. Does it describe the benefits of each treatment?	Benefits can include controlling or getting rid of symptoms, preventing recurrence of the condition, and eliminating the condition, both in the short- and long-term.					
11. Does it describe the risks of each treatment?	Risks can include side effects, complications, and adverse reactions to treatment, both in the short- and long-term.					
12. Does it describe what would happen if no treatment is used?	Look for a description of the risks and benefits of postponing treatment of watchful waiting or of permanently forgoing treatment.					
13. Does it describe how treatment choices affect the overall quality of life?	Look for a description of the effects of treatment choices on day-to-day activity and description of the effects of the treatment choices on the relationships with family, friends, and carers.					
14. Is it clear that there may be more than one possible choice of treatment?	Look for a description of who is most likely to benefit from each treatment choice mentioned and under what circumstances should suggestions of alternatives be considered or investigated further before deciding whether to select or reject a particular treatment choice.					
15. Does it provide support for shared decision-making?	Look for suggestions of things to discuss with family, friends, doctors, or other health professionals concerning treatment choices.					
<b>Rate Question 16 accordingly:</b>						
		1	2	3	4	5
		Low		Moderate		High
		Serious or extensive shortcomings	Potentially important but not serious shortcomings	Minimal shortcomings		
<b>Section 3: Overall rating of the publication</b>						
16. Based on the answers to all above questions, rate the overall quality of the publication as a source of information for treatment choices.						

mentioned that even if new patients are referred by a dentist or a former patient, they go online and check for recommendations or complaints of former patients before they go to the orthodontist. In an online search, patients mostly check if the information is easily reachable, understandable, and helpful. However, these

criteria do not guarantee data validity and quality as data are not properly censored or reviewed for accuracy prior to being publicly accessible. This is probably the case for Turkish patients and websites providing information about health problems and treatments such as orthognathic surgery. However, no quantita-

**Table 2.** Information about evaluated websites and their DISCERN scores

No.	Website	Owner/author of the website	Under which subtitle can a user find out about "orthognathic surgery"?	DISCERN score			
				Section 1 (1-8)	Section 2 (9-15)	Total	Section 3 (16)
1	www.dentgroup.com.tr	Private dental clinic	Orthodontic treatments	10	12	22	1
2	www.ersinulkur.com	Plastic surgeon	Jaw esthetics	13	22	35	3
3	www.dentapolitan.com	Private dental clinic	Orthodontic treatments	14	12	26	3
4	www.maxillofacial.biz	Maxillofacial surgeon	Jaw surgery	16	24	40	4
5	www.cemalsisman.com	Orthodontist	Orthodontic treatments	9	9	18	1
6	www.mustafadeveci.com.tr	Plastic surgeon	Jaw surgery	14	18	32	3
7	www.hakandonmez.com	Orthodontist	Orthodontic treatments	10	13	23	2
8	www.estetikemeliyat.web.tr	Plastic surgeon	Jaw esthetics	13	16	29	2
9	www.ankaraortodonti.net	Orthodontist	Orthodontic treatments	14	15	29	3
10	www.tod.org.tr	Professional organization	Orthodontic treatments	15	15	30	3
11	www.maxillofacial.com	Maxillofacial surgeon	Jaw surgery	15	16	31	4
12	www.ortodontist.com	Private dental clinic	Orthodontic treatments	19	24	43	4
13	www.kemalugurlu.com	Plastic surgeon	Jaw surgery	15	18	33	4
14	www.capaortodonti.com.tr	Orthodontist	Orthodontic treatments	15	17	32	3
15	www.drhakanozdemir.com	Plastic surgeon	Jaw esthetics	13	12	25	3
16	www.serkansagir.com	Orthodontist	Orthodontic treatments	14	18	32	3
17	www.ibrahimcanter.com	Plastic surgeon	Cranio-maxillofacial surgeries	16	22	38	4
18	www.dentram.com	Private dental clinic	Jaw surgery	12	13	25	2
19	www.nedimozer.com	Maxillofacial surgeon	Jaw surgery	19	29	48	4
20	www.esteport.com	Plastic surgeon	Jaw esthetics	9	12	21	1
21	www.drskruyazar.com	Plastic surgeon	Repairing surgeries	17	18	35	3
22	www.ceneestetigi.com	Plastic surgeon	Jaw surgery	12	15	27	3
23	www.ortodontiklinik.com	Private dental clinic	Jaw surgery	10	9	19	1
24	www.izmirklinik.com	Plastic surgeon	Jaw surgery	16	19	35	4
25	www.kozmetikcerahi.com	Plastic surgeon	Jaw esthetics	22	16	38	4
26	www.estetik.gen.tr	Plastic surgeon	Jaw surgery	8	9	17	1
27	www.elifgunduz.com	Orthodontist	Jaw surgery	18	16	34	4
28	www.ortonorm.com	Private dental clinic	Orthodontic treatments	10	10	20	1
29	www.sayinortodonti.com	Orthodontist	Orthodontic treatments	12	8	20	1
30	www.enverakinozkan.com.tr	Orthodontist	Orthodontic treatments	20	25	45	4
31	www.ortodontist.net	Orthodontist	Orthodontic treatments	10	9	19	1
32	www.eraysahinsev.com	Private dental clinic	Jaw surgery	8	10	18	1
33	www.klinik10.com	Private dental clinic	Jaw surgery	10	8	18	1
34	www.ortodontist.com.tr	Orthodontist	Orthodontic treatments	13	10	23	1
35	www.memorial.com.tr	Private hospital	Orthodontic treatments	7	8	15	1
36	www.ortocity.com	Orthodontist	Orthodontic treatments	9	8	17	1
		Mean score		13.25	14.86	28.14	2.47
		Range		7-22	8-29	15-48	1-4

tive analysis was found in the literature. These phenomena led us to evaluate the quality of web-based information on orthognathic surgery in Turkey with the DISCERN instrument. This is the first study conducted to define the quality of websites regarding information on orthognathic surgery in Turkey and is one of the few studies on this issue (11,16). Our study found that the quality of information related to orthognathic surgery varies. Although the results are applicable only locally as the study was based on a Turkish web search about Turkish websites, there are previous examples of orthodontic studies dealing with the use and

quality of orthodontic websites in the UK, Canada, or the USA (8,11,13,21-23). The Internet is an open-access tool for every individual, and this makes it necessary to have information about different languages and countries as English websites may not be eligible for all patients. Publishing these issues in international journals may also help to get the opinions of readers from around the world and may result in better quality.

The objective evaluation of online information has become necessary as the use of web-based health information becomes

**Table 3.** The mean and range of DISCERN scores for maxillofacial surgeons, orthodontists, and plastic surgeons evaluated in the study\*

Profession	Number	DISCERN Scores			
		Section-1 Mean (range)	Section-2 Mean (range)	Total Mean (range)	Section-3 Mean (range)
Maxillofacial surgeons	3	16.67 (15-19)	23 (16-29)	39.67 (31-48)	4 (4)
Orthodontists	11	13.09 (9-20)	13.45 (8-25)	26.54 (17-45)	2.18 (1-4)
Plastic surgeons	12	14 (8-22)	16.42 (9-22)	30.42 (17-38)	2.92 (1-4)

\*Only the scores of websites belonging to a person (not a clinic, hospital, or organization) were included in this table

popular. In the present study, the DISCERN toolkit was used for this purpose in accordance with similar studies (8,11,14,17). This toolkit has been proven to be valid and reliable for information quality of written healthcare information (10,12). It has also reported to have good internal consistency and be user friendly as it is composed of questions that are easy to understand and does not need detailed education beforehand (8,11,24). The idea behind using the DISCERN toolkit is helping users of health information consider all aspects (evidence-based results, benefits, disadvantages, etc.) of a treatment choice and choose the option that is best for them.

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Among other search engines, only Google was used for the online search in the present study. Similar studies about on the evaluation of quality either preferred more than one search engine or only Google (1,2,8,11,13,15,16). Statistical data about the market share of search engines in Turkey till April 2016 showed that more than 90% of Internet users prefer Google as their search engine (25). Aldairy et al. (11) found that Google incorporated the vast majority of links to possible websites. In light of the present data, our results can be used to derive conclusions about a real scenario as it is unlikely that a relevant website was not listed after a Google search.

There were hundreds of websites for each term and almost 1 million websites in total after the initial Google search. Although some authors evaluated the first 100 results, Aldairy et al. (11) pointed out that it is unlikely that patients would visit more than the top 20 results in a regular search (2,8,11). Therefore, we limited our results to the top 25 websites for evaluating the quality, which was in line with the study by Livas et al. (15) The science of being a top-ranked website lies behind understanding two major algorithms of search engines: 1) finding the most relevant answer to the search terms and 2) listing the most dynamic and up-to-date result to the consumer (3). For this reason, it can be assumed that patients receive the most relevant and newest information via those top-ranked websites.

In our study, the Internet search was performed using multiple terms to simulate the typical online search of a patient, which was similar to that used in previous studies (11,15,18). This method increased the probability to reach all possible websites and helped to drive a conclusion about the best terms that the clinicians can recommend to their patients while doing online research. Although the most number of links were found for the term "jaw surgery," the most accurate information was found when the terms "orthognathic surgery" and "jaw operation" were used. Clinicians can recommend their orthognathic patients to use these terms to decrease getting misleading or invalid search results.

Our results demonstrated that although the quality of information on the Internet was variable, the overall quality was low

or medium in most websites. Even the highest DISCERN score (which was 48) was well beyond the maximum possible score (which was 75). The results were similar to, but worse than, the results obtained by Aldairy et al. (11) and Pithon and Santos (16). This can be explained by limited regulations and quality control on the web-based health information share in Turkey. Marketing via social media and the Internet is forbidden with some acts of professional healthcare organizations, but it is legally undefined as to who is eligible to share healthcare information and check its quality regularly. Unfortunately, this is the case for most populations as anyone can publish information on the Internet, which is a point that is criticized by almost all authors dealing with this issue (11,13).

The highest portion of evaluated websites in this study belonged to multi-field professionals related to orthognathic surgery who were running their private practice. These were mostly plastic surgeons and were followed by orthodontists and maxillofacial surgeons (Table 2, 3). To date, no study in this field has evaluated websites according to their authors and emphasized the quality of information provided from their perspectives. Our results showed that although there were only three websites by maxillofacial surgeons, they had a higher number of results than others. Procedures about surgery and the risks and benefits were clearly mentioned. They also provided some information about pre- and post-surgery orthodontic treatment. There were also good quality websites that belonged to plastic surgeons and orthodontists, but as the number of websites increased, the quality varied and mean ratings got lower. The evaluation of the quality of information on orthognathic surgery can be difficult as each author puts his/her perspective about treatment according to their specialty and the focus of each website is different. With this in mind, it was advantageous to use the DISCERN toolkit as it focuses on what the author wants to explain to the reader, how he/she explained it, and if it is supported with accurate sources of information. As the instrument does not relate, compare, and rate the document according to another website or source that can be used as a referral source, each website is uniquely evaluated based on the information it provides.

There were problems with the websites evaluated. First, none of them determined their aims. Second, the sources and production time of information were not mentioned, so it was not clear whether the information was reliable and updated. Knowing the author of the website does not count as a source in objective information on quality and should be taken into account by data providers. Additionally, no links for additional sources of information were provided, and the results of treatment alternatives were not put forward. All patients in modern times want to know more about treatment options, play an active role in the decision-making process of their treatment procedures, and receive the best possible care (22). In particular, this is the



case for orthognathic patients, who often search the Internet before they decide the treatment. If clinicians can address all risks and benefits together with detailed information about the entire treatment procedure, it will possibly increase patient satisfaction rates (18). Therefore, we believe that it would be beneficial for practices that perform orthognathic surgery in Turkey to re-evaluate and improve their websites based on the results of our study.

The uncontrollable nature of the Internet cause healthcare professionals to be cautious about giving advice to their patients for further reading from online sources (11,26). One of the reasons for this might be the increase in websites belonging to private practices as was the case in our study as well. There was no official organization's website, except the Turkish Orthodontic Society, that can provide unbiased information about orthognathic surgery. Unfortunately, private practice websites generally promote rather than inform, and this might raise questions in patients' minds. For this reason, there is a gap in this area that is waiting to be urgently filled by either professional public organizations representing orthognathic surgery team members or educational institutions, such as universities, that do not have profit concerns.

## CONCLUSION

The quality of information about orthognathic surgery in Turkey was variable, but generally low. Patients seeking information online should be aware of the limitations of the Internet and understand that web-based information can only be used as a support for professional medical consultations.

**Ethics Committee Approval:** As the paper does not deal with humans or any material previously collected from humans, no ethical approval was taken.

**Informed Consent:** There was no written consent form for this study as it doesn't contain any material collected from humans.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - N.C.B., B.B.T.; Design - N.C.B.; Supervision - B.B.T.; Resources - N.C.B.; Materials - N.C.B.; Data Collection and/or Processing - N.C.B.; Analysis and/or Interpretation - N.C.B., B.B.T.; Literature Search - N.C.B.; Writing Manuscript - N.C.B.; Critical Review - N.C.B., B.B.T.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study has received no financial support.

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