



# Evaluation of the Website Information About Orthopaedics and Traumatology Via the Example of Hallux Valgus

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## Abstract

**Objective:** The aim is to evaluate the content and quality of the most frequently accessed websites for information on the internet about the commonly observed orthopedic problem of hallux valgus.

**Methods:** The keywords hallux valgus and hallux valgus treatments were screened in internet (www.google.com.tr). In each search, the first 30 sites listed were investigated. The repeated and advertising sites were eliminated. A total of 43 websites were evaluated. Internet websites were classified into 4 categories of doctor websites, news websites, health-related sites and unclassified. Firstly, content evaluation of the sites used the previously prepared questions and gave points out of 20. Later, the discern evaluation system was used for general assessment.

**Results:** When the information accuracy of the 43 websites included in the investigation was evaluated, mean points from the 20-question survey were determined to be 9.3 [minimum: 2, maximum: 18, standard deviation (SD): 3.8]. The most accurate information appeared to be under the headings of definition of hallux valgus (97.7%), reasons for the formation (76.7%), predisposing situations (88.4%) and use of orthotic devices (83.7%). According to the discern evaluation table, doctor websites (mean: 11, SD: 4.9) received the highest points, while sites with undetermined references received the lowest points (mean: 6.0, SD: 1.7).

**Conclusion:** Information obtained from the internet about health is stated to be insufficient in the literature, as in our study. Considering that websites offering insufficient or erroneous information cannot be prevented, we believe that it is necessary to branch organizations and health institutions to perform studies to close the gap in this area.

**Keywords:** Hallux valgus, websites, awareness, internet

## INTRODUCTION

Currently, due to the internet being in every house, even in every mobile telephone, it has become the most frequently used tool to access information. In Turkey, generally, the number of broadband internet subscribers reached 73.8 million in 2018 (1). The proportion of people searching for information related to health on the internet was stated to be 69.3% (2). These numbers show that due to easy access, the internet has become a very commonly used tool to access information in the area of health, as in many other areas.

Due to frequent use, it is clear that most of the society access their information in the health field from the internet, while there are not many studies on the quality of this information and sufficiency levels for important topics like health.

Hallux valgus is a common foot deformity in society, where the first toe deviates laterally while the first metatarsal deviates medial. The literature shows variability in different populations, with prevalence ranging from 20-65% (3-5).

In this study, we evaluated the content of websites that provide health-related information and the accuracy of the information they provide, using hallux valgus, a common foot disease.



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**Cite this article as:** Bozođlan M, Daniřman M, Demir T, Esenyel CZ. Evaluation of the Website Information About Orthopaedics and Traumatology Via the Example of Hallux Valgus. Eur Arch Med Res 2022;38(2):96-101

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European Archives of Medical Research published by Galenos Publishing House.

**Received:** 12.08.2020  
**Accepted:** 13.03.2021

## METHODS

On the most commonly used search engine in Google Turkey ([www.google.com.tr](http://www.google.com.tr)), the keywords “hallux valgus” and “hallux valgus treatment” in the Turkish language (halluks valgus and halluks valgus tedavisi) were searched in November 2019. For each search the first 30 websites were listed as the most commonly investigated after that the websites for advertising and the websites with the same titles were eliminated. A total of 43 websites were evaluated. Accuracy information on the evaluated sites was performed according to a 20-question survey that we created in accordance with the literature (Table 1). Based on whether the website content answered these questions or not, each question was given 1 point with 20 points obtainable. According to the points, websites with 1-5 points were assessed as insufficient, 5-10 points were moderate, 11-15 points were

sufficient and 15-20 points were perfect. For the general evaluation of the sites, the discern evaluation survey was used (Table 2). Fifteen questions modified from the discern scale were used to give points from 1 to 5 on a graded scale (1-2: No, 3-4: Partly, 5: Yes). According to the mean total points obtained, the quality of websites was evaluated as 0-5 points low (severely deficient), 6-10 points moderate (seriously deficient), and 11-15 points high (minimally deficient). Websites were also classified into 4 categories according to content (1- Doctor websites, 2- News websites, 3- Health-related websites, 4- Unclassified). Each website is rated independently, within one week, by two observers, using the references cited below as a source (6,7).

### Statistical Analysis

Descriptive statistics for data used mean, standard deviation (SD), median, minimum, maximum, frequency and proportion values. The distribution of variables was measured with the Kolmogorov-Smirnov test. Analysis of dependent variables used the Wilcoxon test. The SPSS 22.0 program was used for analyses. Since our study was an internet screening, ethics committee approval was not obtained.

## RESULTS

Of the 43 websites included in the investigation, 10 were doctor personal websites (23.2%), 11 were news websites (25.5%), 14 were health-related sites (32.5%) and 8 were unclassified (18.6%). When information accuracy is evaluated, mean points for the 20-question survey were determined as 9.3

Main headings	Topic	Points
Definition of hallux valgus	What is hallux valgus?	1
	Reasons for occurrence of hallux valgus	1
	Is there family heredity?	1
	Does hallux valgus occur at young ages?	1
Conservative treatment	Situations causing tendency towards hallux valgus	1
	Use of special devices	1
	Does use of devices cause improvement?	1
Surgical treatment	Is there a role for exercise in treatment?	1
	When should surgery happen?	1
	Are there different surgery choices?	1
	Will be there definite improvement with surgery?	1
Rehabilitation	Is there recurrence after surgery?	1
	Use of special shoes after surgery	1
	Use of devices after surgery	1
Diagnostic method	Situations requiring care after surgery	1
	Physical examination	1
Complications	Standing radiography	1
	Problems that may occur during conservative surveillance	1
	Problems that may occur after surgical treatment	1
	What should be done in these situations	1

Are aims stated openly?
Does it achieve aims?
Is it related to the topic?
Is the source of information clear?
Is the date of information current?
Prejudiced and balanced
Does it provide additional resources for information and support?
Are there references in uncertain areas?
Does it give information about function of treatment?
Benefits of treatment
Does it explain risks of treatment?
Does it define what may happen if treatment is not given?
Does it define how chosen treatment will affect quality of life?
Is it clear about more than one treatment choice?
Does it provide support for shared decisions?
General evaluation of website

		Group I		Group II		Group III		Group IV		Total	
		n	%	n	%	n	%	n	%	n	%
What is hallux valgus?	Wrong	1	10.0%	0	0.0%	0	0.0%	0	0.0%	1	2.3%
	Correct	9	90.0%	11	100.0%	14	100.0%	8	100.0%	42	97.7%
Reasons for occurrence of hallux valgus	Wrong	2	20.0%	2	18.2%	4	28.6%	2	25.0%	10	23.3%
	Correct	8	80.0%	9	81.8%	10	71.4%	6	75.0%	33	76.7%
Is there family heredity?	Wrong	3	30.0%	6	54.5%	4	28.6%	4	50.0%	17	39.5%
	Correct	7	70.0%	5	45.5%	10	71.4%	4	50.0%	26	60.5%
Does hallux valgus occur at young ages?	Wrong	4	40.0%	10	90.9%	9	64.3%	8	100.0%	31	72.1%
	Correct	6	60.0%	1	9.1%	5	35.7%	0	0.0%	12	27.9%
Situations causing tendency towards hallux valgus	Wrong	0	0.0%	1	9.1%	2	14.3%	2	25.0%	5	11.6%
	Correct	10	100.0%	10	90.9%	12	85.7%	6	75.0%	38	88.4%
Use of special devices	Wrong	2	20.0%	2	18.2%	1	7.1%	2	25.0%	7	16.3%
	Correct	8	80.0%	9	81.8%	13	92.9%	6	75.0%	36	83.7%
Does use of devices cause improvement?	Wrong	2	20.0%	7	63.6%	6	42.9%	4	50.0%	19	44.2%
	Correct	8	80.0%	4	36.4%	8	57.1%	4	50.0%	24	55.8%
Is there a place for exercise in treatment?	Wrong	9	90.0%	11	100.0%	11	78.6%	6	75.0%	37	86.0%
	Correct	1	10.0%	0	0.0%	3	21.4%	2	25.0%	6	14.0%
When should surgery happen?	Wrong	2	20.0%	0	0.0%	6	42.9%	5	62.5%	13	30.2%
	Correct	8	80.0%	11	100.0%	8	57.1%	3	37.5%	30	69.8%
Are there different surgery choices?	Wrong	2	20.0%	2	18.2%	4	28.6%	6	75.0%	14	32.6%
	Correct	8	80.0%	9	81.8%	10	71.4%	2	25.0%	29	67.4%
Will be there definite improvement with surgery?	Wrong	7	70.0%	6	54.5%	8	57.1%	7	87.5%	28	65.1%
	Correct	3	30.0%	5	45.5%	6	42.9%	1	12.5%	15	34.9%
Is there recurrence after surgery?	Wrong	7	70.0%	9	81.8%	8	57.1%	7	87.5%	31	72.1%
	Correct	3	30.0%	2	18.2%	6	42.9%	1	12.5%	12	27.9%
Use of special shoes after surgery	Wrong	3	30.0%	6	54.5%	8	57.1%	8	100.0%	25	58.1%
	Correct	7	70.0%	5	45.5%	6	42.9%	0	0.0%	18	41.9%
Use of devices after surgery	Wrong	10	100.0%	9	81.8%	13	92.9%	7	87.5%	39	90.7%
	Correct	0	0.0%	2	18.2%	1	7.1%	1	12.5%	4	9.3%
Situations requiring care after surgery	Wrong	5	50.0%	7	63.6%	7	50.0%	7	87.5%	26	60.5%
	Correct	5	50.0%	4	36.4%	7	50.0%	1	12.5%	17	39.5%
Physical examination	Wrong	2	20.0%	6	54.5%	6	42.9%	7	87.5%	21	48.8%
	Correct	8	80.0%	5	45.5%	8	57.1%	1	12.5%	22	51.2%
Standing radiography	Wrong	3	30.0%	8	72.7%	8	57.1%	8	100.0%	27	62.8%
	Correct	7	70.0%	3	27.3%	6	42.9%	0	0.0%	16	37.2%
Problems that may occur during conservative surveillance	Wrong	7	70.0%	8	72.7%	13	92.9%	7	87.5%	35	81.4%
	Correct	3	30.0%	3	27.3%	1	7.1%	1	12.5%	8	18.6%
Problems that may occur after surgical treatment	Wrong	6	60.0%	9	81.8%	11	78.6%	7	87.5%	33	76.7%
	Correct	4	40.0%	2	18.2%	3	21.4%	1	12.5%	10	23.3%
What should be done in these situations	Wrong	9	90.0%	11	100.0%	13	92.9%	8	100.0%	41	95.3%
	Correct	1	10.0%	0	0.0%	1	7.1%	0	0.0%	2	4.7%

(minimum: 2, maximum: 18, SD: 3.8) (Table 3). Of the websites, 7 were insufficient (16.2%), 21 were moderate (48.8%), 12 were sufficient (27.9%) and 3 were perfect (6.9%). The highest points

were received by doctor personal websites and health-related sites, while sites classified in the unclassified group (generally commercial websites) appeared to receive lower points. The most accurate information was observed for the headings of definition of hallux valgus (97.7%), reasons for the formation (76.7%), predisposing situations (88.4%) and use of orthotic devices (83.7%). The most insufficient information appeared to be about juvenile hallux valgus, role of exercise in treatment, problems that may be caused by conservative or surgical treatment and what should be done in this situation (Figure 1). According to the discern evaluation table, doctor personal sites received the highest points (mean: 11.4, SD: 4.9), while websites with unknown references received the lowest points (mean: 6.0, SD: 1.7) (Table 4). Generally, websites with high points on the discern evaluation received high points on the information accuracy evaluation but this is not statistically significant ( $p>0.05$ ). There were no significant differences identified for information accuracy and general evaluation of websites between the two experts ( $p>0.05$ ).

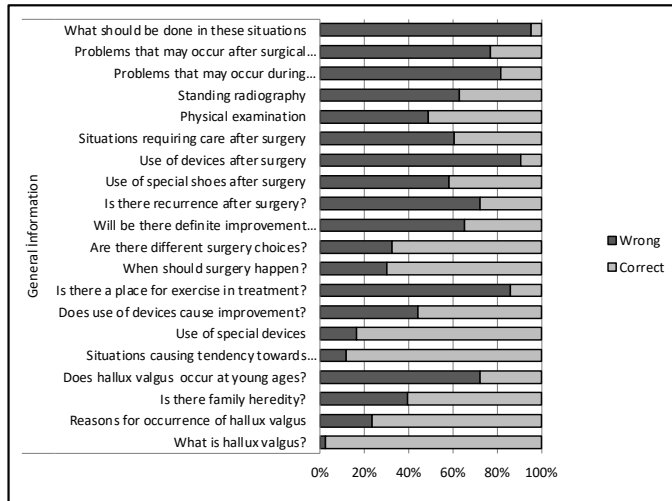


Figure 1. Evaluation of the given answers in the websites

	Group I		Group II		Group III		Group IV		p
	Mean ± SD	Med	Mean ± SD	Med	Mean ± SD	Med	Mean ± SD	Med	
General information total points	11.4±4.9	12.0	9.1±2.2	9.0	9.9±3.8	9.5	6.0±1.7	6.0	0.052
Are aims stated openly?	3.9±0.7	4.0	3.5±1.1	3.0	3.4±1.2	3.0	2.9±1.0	3.0	0.175
Does it achieve aims?	3.3±0.9	3.0	3.1±0.8	3.0	2.9±1.5	2.5	2.5±1.1	2.0	0.301
Is it related to the topic?	3.7±0.7	4.0	3.1±0.8	3.0	3.4±1.2	3.0	2.6±1.2	2.5	0.136
Is the source of information clear?	2.5±1.3	2.0	2.1±1.2	2.0	2.1±1.3	2.0	1.5±0.5	1.5	0.342
Is the date of information current?	1.5±1.3	1.0	1.5±0.7	1.0	1.5±1.1	1.0	1.0±0.0	1.0	0.328
Prejudiced and balanced	2.4±1.0	2.0	1.9±0.8	2.0	2.4±1.0	2.0	1.8±0.7	2.0	0.262
Does it provide additional resources for informations and support?	1.4±1.3	1.0	1.6±0.8	1.0	1.6±1.2	1.0	1.0±0.0	1.0	0.139
Are there references in uncertain areas?	2.2±1.1	2.0	2.3±1.0	2.0	1.9±1.2	1.5	2.0±0.5	2.0	0.673
Does it give information about function of treatment?	3.5±0.7	3.0	3.0±1.0	3.0	2.7±1.2	3.0	3.3±0.9	3.0	0.203
Benefits of treatment	3.5±0.7	3.0	2.9±1.0	3.0	3.1±0.9	3.0	3.1±1.0	3.0	0.544
Does it explain risks of treatment?	2.4±1.4	2.0	2.3±0.8	2.0	2.5±1.4	2.0	1.9±0.8	2.0	0.778
Does it define what may happen if treatment is not given?	2.5±1.2	2.5	2.6±1.2	3.0	2.1±1.5	1.0	1.9±0.8	2.0	0.319
Does it define how chosen treatment will affect quality of life?	3.3±0.7	3.0	2.7±0.8	3.0	2.9±1.1	3.0	3.0±1.1	3.0	0.357
Is it clear about more than one treatment choice?	3.4±0.8	3.0	2.5±0.7	2.0	3.1±1.3	3.0	2.6±0.5	3.0	0.123
Does it provide support for shared decisions?	2.6±1.0	2.0	2.0±0.4	2.0	2.9±1.3	2.0	2.3±0.5	2.0	0.200
General evaluation of website	3.1±1.1	3.0	2.5±0.9	2.0	2.5±1.5	2.0	1.8±0.9	1.5	0.103

SD: Standard deviation

## DISCUSSION

In this study, we evaluated the content of websites that provide health-related information and the accuracy of the information they provide, using hallux valgus, a common foot disease.

With the aid of developing technology, the internet is currently easily accessible and has become the first source of information for many topics. However, due to the lack of regulation of websites providing information on the internet, intense information pollution is present for nearly every topic. This situation may lead to negative outcomes for internet users. Most of the time, children are affected by this negative tableau (8). Cases of mortality because of applying erroneous information accessed on the internet in relation to health have been reported (9). According to 2019 data, health-related internet searches reached levels of 69.3%. These data are generally reviewed from health-related websites and the information content and accuracy of information is not assessed. In our study, we chose a pilot topic in the branch of orthopaedics and traumatology; thus, we evaluated the accuracy of content accessed from a large information source.

The product of the first study for the accreditation of websites is the discern scale (the discern instrument). discern scale can be used by manufacturers, healthcare professionals and patients to evaluate written information about treatment options, it is the first standardized quality index of consumer health information. The discern (awareness) survey was conducted to judge the quality of written information on the internet, to set standards and to facilitate the production of high-quality evidence-based information by providing a reference point for authors (10). Our aim in using this scale was to evaluate the sites we evaluate in terms of orthopedic knowledge at the same time in terms of their quality and to evaluate the relationship between the two parameters. We found that the websites that are well designed in terms of content and have higher scores than discern scale is more satisfactory in terms of information content.

Küçükdurmaz et al. (11) evaluated the top 10 websites in the search engines of Google, Yahoo and MSN in a table in a study dealing with meniscus discomfort in 2012. Of these 60 websites, 33 websites were evaluated after eliminating repeated sites from different search engines. Each accurate piece of information was given 1 point in the table with an evaluation based on 20 points. They found the mean points for evaluated websites was 12.09. When distributed according to topic headings, the most sufficient information was about etiology, with most insufficient information about rehabilitation. In conclusion, they noted that this deficient information could cause problems for both

clinicians and patients (11). In our study, we used a 20-point evaluation table under the main headings of definitions, diagnostic methods, conservative and surgical treatment, rehabilitation and complications. The evaluated sites received a mean point of 9.3. Additionally, according to the discern evaluation, most sites did not state the date of information and references and did not offer any additional references to support information. We think this leads to controversy about the reliability of these websites.

Elhassan et al. (12) evaluated 24 websites in a study related to discectomy and reported that the mean information quality was weak. The same study reported increasing internet use and that the information content of websites had not increased by sufficient proportions (12).

Elliott et al. (13) evaluated the information quality and website authors for 105 websites about total ankle arthroplasty. Independent of author, they observed that all sites had low information quality. In conclusion, they emphasized that cooperative work between internet website hosts and experts on the topic was important for patients to be informed accurately (13).

Winship et al. (14) reported that non-profit and academic websites provided the most reliable and accurate information in a study of the most common 10 diagnoses in pediatric orthopedics. Interestingly, they reported that websites run by clinicians and commercial websites provided the least reliable information (14).

Zhang et al. (15) screened for 3 different terms (broken collar bone, collar bone fracture and clavicle fracture) in 3 different search engines. They evaluated the quality and readability of 91 websites. The evaluation found that mean website quality was very low and readability levels were far from recommended. They found that the information quality from academic sites was better, while that commercial sites was insufficient. In conclusion, they emphasized that patients should be prevented from accessing commercial sites and directed toward academic sites (15).

### Study Limitations

In our study, we obtained similar results with literature in spite of the more common use of the internet through the years and the increase in health searches. A limitation of our study is that we assigned points to website content as accurate or erroneous according to our created survey table, so it was difficult to differentiate websites with missing information or mistaken information. To reduce this to a minimum, two different observers

separately evaluated the websites. We evaluated the information accuracy of the websites on 2 review articles published about hallux valgus. No significant differences were identified between the observers. Most websites we evaluated were news content or commercially associated sites and we observed that information levels were not sufficient. In our search on the internet, we observed that health-related associations and institutions do not provide publications on the official websites for informing the public. We believe that this is an important reason for the accuracy of the health-related information obtained from the internet. This deficiency can be solved by the publications of expert professionals, related branch organizations and official institutions to inform patients and by directing the public to these official websites. In this way, both spending in the area of health will be reduced and more productive dialog will be created between patients and clinicians.

## CONCLUSION

In Turkey, the accuracy of the information reached in the field of health on the internet and adequacy of the websites that provide this information is not at a good level as in the world. Considering that websites offering insufficient or erroneous information cannot be prevented, we believe that it is necessary to branch organizations and health institutions to perform studies to close the gap in this area. Health-related associations and institutions have a responsibility to obtain a more accurate and source-specific information on the internet and should play a more active role in this matter. Otherwise, the information pollution on the internet will harm both people and healthcare workers. For further studies, evaluations of these websites through the patient point of view can provide more benefits.

## Ethics

**Ethics Committee Approval:** Since our study was an internet screening, ethics committee approval was not obtained.

**Informed Consent:** None.

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

## Authorship Contributions

Concept: M.B., C.Z.E., Design: M.B., T.D., C.Z.E., Data Collection or Processing: M.B., M.D., Analysis or Interpretation: M.B., M.D., T.D., C.Z.E., Literature Search: M.B., M.D., T.D., Writing: M.B., M.D., T.D., C.Z.E.

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

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

## REFERENCES

1. Bilgi Teknolojileri ve İletişim Kurumu. Türkiye Elektronik Haberleşme Sektörü Pazar Verileri Raporu 2018; Üçüncü Çeyrek: 14. Available from: <https://www.btk.gov.tr/uploads/pages/pazar-verileri/2018-3-ceyrekraporu-26-12-18-kurum-disi.pdf>
2. Türkiye İstatistik Kurumu. Hanehalkı Bilişim Teknolojileri Kullanım Araştırması İnternet Kullanım İstatistikleri 2019:6. Available from: [https://data.tuik.gov.tr/Bulten/Index?p=Hanehalki-Bilisim-Teknolojileri-\(BT\)-Kullanim-Arastirmasi-2019-30574](https://data.tuik.gov.tr/Bulten/Index?p=Hanehalki-Bilisim-Teknolojileri-(BT)-Kullanim-Arastirmasi-2019-30574)
3. Benvenuti F, Ferrucci L, Guralnik JM, Gangemi S, Baroni A. Foot pain and disability in older persons: an epidemiologic survey. *J Am Geriatr Soc* 1995;43:479-84.
4. Dunn JE, Link CL, Felson DT, Crincoli MG, Keysor JJ, McKinlay JB. Prevalence of foot and ankle conditions in a multiethnic community sample of older adults. *Am J Epidemiol* 2004;159:491-8.
5. Cho NH, Kim S, Kwon DJ, Kim HA. The prevalence of hallux valgus and its association with foot pain and function in a rural Korean community. *J Bone Joint Surg Br* 2009;91:494-8.
6. Kılıçođlu Ö. Diseases of the great toe: Hallux valgus and hallux rigidus. *TOTBİD Dergisi* 2013;12:390-406.
7. Dođan A, Üzümcüđil O, Akman YE. Halluks valgus. *TOTBİD Dergisi* 2007;6:88-94.
8. Yalçın S, Kondolot M. The internet and child. *Türkiye Klinikleri J Pediatr Sci* 2008;4:82-7.
9. Hainer MI, Tsai N, Komura ST, Chiu CL. Fatal hepatorenal failure associated with hydrazine sulfate. *Ann Intern Med* 2000;133:877-80.
10. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. *J Epidemiol Community Health* 1999;53:105-11.
11. Küçükdurmaz F, Aytekin MN, Tuncay İ, Sen C. A pilot study about quality of information at health related in Turkish websites: meniscus tear. *Nobel Med* 2013;9:114-7.
12. Elhassan Y, Sheridan G, Nassiri M, Osman M, Kiely P, Noel J. Discectomy-related information on the internet: does the quality follow the surge? *Spine (Phila Pa 1976)* 2015;40:121-5.
13. Elliott AD, Bartel AF, Simonson D, Roukis TS. Is the internet a reliable source of information for patients seeking total ankle replacement? *J Foot Ankle Surg* 2015;54:378-81.
14. Winship B, Grisell M, Yang CB, Chen RX, Bauer AS. The quality of pediatric orthopaedic information on the internet. *J Pediatr Orthop* 2014;34:474-7.
15. Zhang D, Schumacher C, Harris MB. The quality and readability of internet information regarding clavicle fractures. *J Orthop Sci* 2016;21:143-6.