

Readability and Contents Evaluation of Patient Informing Texts on Orthognathic Surgery in Turkish Websites: Methodological Study

Türkçe Web Sitelerindeki Ortognatik Cerrahi ile İlgili Hasta Bilgilendirme Metinlerinin Okunabilirlik ve İçerik Değerlendirmesi: Metodolojik Çalışma

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ABSTRACT Objective: Orthognathic surgery is the applications performed to eliminate the disorders in the face and jaw structure of the person and to regain the normal functions of the teeth together with the jaws. Upon the increasing internet use, people reach the first knowledge about these surgeries, where serious complications can be seen, through websites. It is aimed to assess the Turkish texts released on the internet on orthognathic surgery regarding readability and contents in this study. **Material and Methods:** The first 71 websites were examined in the Google (Google LLC, Mountain View, California, USA) search using the keywords “orthognathic surgery.” Obtained patient informing texts were assessed in accordance with Atesman Readability Index. The contents were also assessed regarding to whether they provide sufficient information about surgery or not. **Results:** It was observed that the texts which have been examined in the study were of moderate difficulty subject to the Atesman Readability Index (54.8±9.4). It was concluded that the contents of the information on the examined websites in research had been sufficient regarding to the surgical preparation process, but surgical complications had not been adequately referred. **Conclusion:** The results of the study showed that the patient informing texts on Turkish websites have moderate readability difficulties. It was observed that possible complications were not covered enough although sufficient information has been provided about the preparation process of orthognathic surgery and it was concluded that the expected effects on the reader would not be observed if they were not understood by the patients.

Keywords: Orthognathic surgery; readability; patient informing texts

ÖZET Amaç: Ortognatik cerrahi, kişinin yüz ve çene yapısındaki bozuklukları gidermek ve dişlerin çenelerle birlikte normal fonksiyonlarını kazanması için gerçekleştirilen uygulamalardır. Ciddi komplikasyonların görülebileceği bu cerrahiler hakkında insanlar ilk bilgiye, artan internet kullanımı ile beraber web siteleri üzerinden ulaşmaktadırlar. Bu çalışmada, ortognatik cerrahi ile ilgili internette bulunan Türkçe metinlerin okunabilirlik ve içerik açısından değerlendirilmesi amaçlanmıştır. **Gereç ve Yöntemler:** “Ortognatik cerrahi” anahtar kelimeleri kullanılarak yapılan Google (Google LLC, Mountain View, California, ABD) aramasında ilk 71 web sitesi incelenmiştir. Elde edilen hasta bilgi metinleri Atesman Okunabilirlik İndeksi'ne göre değerlendirilmiştir. İçeriklerin ayrıca cerrahi hakkında yeterli bilgi sağlayıp sağlamadıkları açısından da değerlendirilmeleri sağlanmıştır. **Bulgular:** Çalışmada incelenen metinlerin Atesman Okunabilirlik İndeksi'ne (54,8±9,4) göre orta zorlukta olduğu anlaşılmıştır. Araştırmada incelenen web sitelerinde yer alan bilgilerin içeriğinin cerrahi hazırlığı süreci anlamında yeterli olduğu, ancak cerrahi komplikasyonlara yeterince değinilmediği sonucuna ulaşılmıştır. **Sonuç:** Çalışmanın sonuçları, Türkçe web sitelerinde bulunan hasta bilgilendirme metinlerinin orta düzeyde okuma güçlüğüne sahip olduğunu göstermiştir. Ortognatik cerrahinin hazırlık süreciyle ilgili yeterli bilgi verilmesine rağmen olası komplikasyonlara yeterince yer verilmediği görülmüştür, hastalar tarafından anlaşılmadığı takdirde okuyucu üzerinde hedeflenen etkileri görülmeyeceği sonucuna ulaşılmıştır.

Anahtar Kelimeler: Ortognatik cerrahi; okunabilirlik; hasta bilgilendirme metinleri

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Peer review under responsibility of Türkiye Klinikleri Journal of Dental Sciences.

Received: 23 Jun 2022 **Accepted:** 14 Dec 2022 **Available online:** 20 Dec 2022

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The use of the internet is increasing day by day for people who want to get information about health, so the internet has become the first source. The advantage of this resource in transferring health information to common patients has come to the fore scientifically.^{1,2} According to the data of the Turkish Statistical Institute, the internet users' number between ages, 14-74 increased from 53.8-79% in the last 5 years (2016-2021).^{3,4}

While orthognathic surgery meets the expectations of patients such as aesthetics and function, it is a multidisciplinary treatment with complications causing lowering life quality of the patient such as pain, edema, trismus, difficulty in swallowing, chewing and breathing, sensory defects due to nerve damage, temporomandibular joint dysfunction, limitation of head and neck movements relapse in postoperative period.⁵

It has critical importance that patients should be adequately informed before these surgeries, which have a very high risk of complications, and internet use may be a suitable option to increase public awareness about preparation for important surgeries such as orthognathic surgery.⁵ Additionally, it's critical that texts containing adequate and intelligible information be available to regular citizens. It should be written succinctly and in a style that the reader can follow and understand. Since the term "readability" is a mathematical term, evaluating it produces unbiased findings.^{4,6} This study aimed assessing the Turkish texts about orthognathic surgery found on the internet regarding to readability and contents.

MATERIAL AND METHODS

Ethics committee approval was not required because only publicly available information was used in this study. The top 71 websites reached in a Google search (Google LLC, Mountain View, California, USA) using the keywords "Orthognathic surgery" in June 2022 were examined. The investigation excluded texts with fewer than 20 sentences, papers written for academic publications, forum sites, sites designed for health professionals, and commercial websites. From these websites, 60 texts that were instructive texts for patients were copied and pasted into Microsoft Excel (Microsoft Corporation, Red-

mond, Washington, USA). The authors and addresses of the websites under examination were noted.

READABILITY MEASUREMENT

In our research, we employed a formula created by Atesman in 1997.⁷ This formula was progressed through adapting the Flesch Reading Ease Formula into Turkish. Various formulas, measurements and indexes were used in readability analysis. For this purpose, formulas such as Gunning-Fog value, Smog-simple measurement, ARI-automatic readability index, Flesch-Kincaid value have been developed; Atesman Readability Index is a formula developed through using average word and sentence lengths in accordance with the Turkish Language structure.⁸ Atesman developed a formula through using mathematical values coherent for the Turkish language structure.⁷ The Atesman reading level was calculated using a free online readability tool (<http://okunabilirlikindeksi.com/>). The acquired data was then imported into Microsoft Excel.

ASSESSMENT OF THE TEXTS' CONTENTS

We have already asked the following questions in name of assessing the patient informing contents in the texts: "Has the pre-surgical preparation stage been mentioned?", "Was the surgical method explained enough?", "Were complications mentioned?" An Oral Surgeon, and a Maxillofacial Surgeon and a General Dentist assessed the contents of the text.

ANALYSIS OF DATA

SPSS 23 (SPSS Inc., Chicago, IL, USA) statistical package program was used for analyzing of data. The normal division of the data was calculated with the Kolmogorov-Smirnov test within the scope of the study (Table 1). According to the obtained results; all data do not show normal distribution. The average standard deviation and minimum maximum values of the data were calculated.

RESULTS

31% of the examined websites are orthodontic clinics websites, 31% are private clinics, 7% are academic websites aiming to train health professionals, and 7% are plastic surgery clinics websites.

TABLE 1: Normality test results.

	Kolmogorov-Smirnov		
	statistic	df	p value
Number of word	0.235	70	0.000
Number of characters	0.234	70	0.000
Number of difficult words	0.236	70	0.000
Number of unique words	0.195	70	0.000
Number of short word (<5 characters)	0.237	70	0.000
Number of characters without spaces	0.233	70	0.000
Number of sentences	0.186	70	0.000
Number of paragraph	0.195	70	0.000
Average word length	0.132	70	0.004
Average sentence length	0.150	70	0.000
Atesman Readability Index	0.125	70	0.008

The results obtained from 60 examined websites are presented below. First of all, the websites which were examined by using the Atesman readability classification were classified in the study (Table 2). According to the findings which were obtained in the study; 2.9% of the websites were very easy, 17.1% easy, 72.9% moderately difficult and 7.1% difficult (Figure 1).

Linguistic statistics of the texts are presented in Table 3. The mean number of words is 554.5±528.2. The average number of characters is 4419.4±4190.8. The average number of difficult words is 545.1±520.2. The average number of unique words

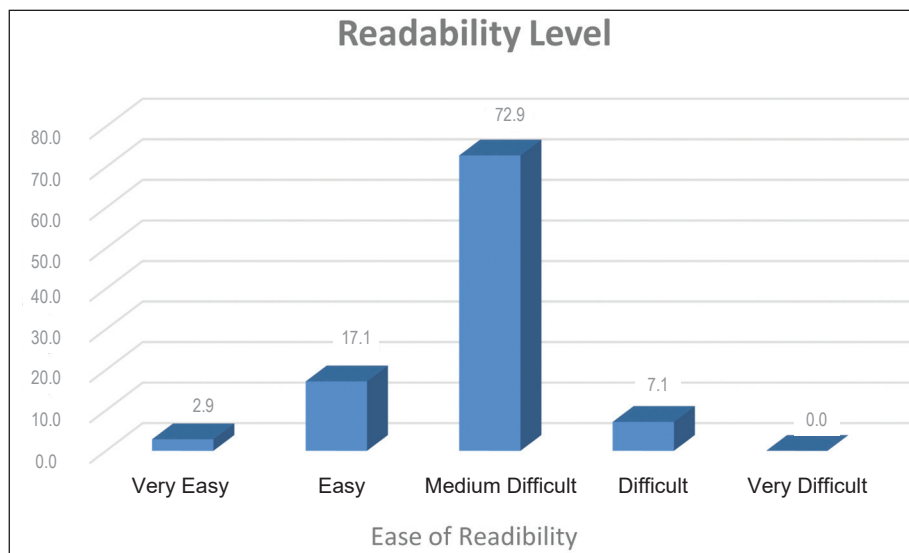
is 328.5±262.1. The average number of short words is 98.3±94.6. The average number of characters without spaces is 3844.2±3646.1. The average number of sentences is 49.3±44. The average number of paragraphs is 24.8±23. The average word length is

TABLE 2: Assessment of the examined websites according to their kinds.

	f	%
Web including advertisements	3	4.2
Newspaper	1	1.4
Academic article	7	9.9
Blog texts	2	2.8
Internet encyclopedia	1	1.4
Surgical society	1	1.4
Jaw surgery clinic	1	2.8
Orthodontic society	1	1.4
Orthodontic clinic	22	31.0
Private dental clinics	22	31.0
Plastic surgery clinics	5	7.0
University websites	3	4.2

TABLE 3: Atesman readability classification.

	Atesman Readability Index range
Very easy	90-100
Easy	70-89
Moderately difficult	50-69
Difficult	30-49
Very difficult	1-29

**FIGURE 1:** The readability level of websites.

2.8±0.1. The average sentence length is 11.6±3.2. The mean Atesman Readability Index is 54.8±9.4 (Table 4).

When the readability levels of the texts are examined; 34% of the texts were at the Grade 11-12 readability level, 28% of them were Grades 9-10. It was determined that it has been at the class readability level (Table 5).

The study looked at the language characteristics of patient-informing materials published on 60 websites. We calculated the number of words, characters, average word length, sentences, and average sentence length (Table 4). Additionally, the average of the Atesman index and the readability level of the texts were placed in the same table.

While the readability of all sites was on average at a medium level, according to Atesman, it was found that readers in the Grade 11-12 range and higher could understand the content. It was discovered that of the websites analyzed, 2.9 percent were extremely easy, 17.1 percent were simple, 72.9 percent were moderately difficult, and 7.1 percent were challenging (Table 3).

Patient education texts published on the 60 websites analyzed in the study were studied in order to evaluate the text content. A general practitioner, an oral surgeon, a dental surgeon, and a maxillofacial surgeon with at least 5 years of experience carried out

the assessment. The definition of surgery, preoperative preparation, possible complications during surgery, and post-surgical recovery were assessed regarding to sub-headings in the articles. When the patient informing texts were examined, it was seen that only 11.2% of the websites included possible complications during and after the surgery, despite it was clearly explained what orthognathic surgery was and what the preparation process was before the surgery. These risks, which were widely explained on the websites of the surgical clinic and surgical society, were included by 4.5% of the private dental clinics and orthodontic clinics websites.

DISCUSSION

Patients today have easier access to health information thanks to the growth in internet users and the accessibility of knowledge online.⁴ Although information is presented in video and audio format on the internet, most information is generally available in written text format.⁹ Therefore, the readability of written text patient informing texts is important. This study is the first one which is evaluating patient informing texts written in Turkish about orthognathic surgery. The study's findings revealed that Turkish websites' patient informational texts had a fairly demanding level (54.8±9.4). It is well known that when people have health issues, they visit the internet for

TABLE 4: Linguistic statistics of texts.

	n	Minimum	Maximum	Average	Std. deviation
Number of word	70	56	2635	554.5	528.2
Number of characters	70	450	20986	4419.4	4190.8
Number of difficult words	70	56	2593	545.1	520.2
Number of unique words	70	48	1365	328.5	262.1
Number of unique words (%)	70	50	86	65.7	8.8
Number of short word (<5 characters)	70	10	414	98.3	94.6
Number of short word (<5 characters) (%)	70	12	28	17.9	3.3
Number of characters without spaces	70	394	18316	3844.2	3646.1
Number of sentences	70	5	203	49.3	44.0
Number of paragraph	70	1	98	24.8	23.0
Average word length	70	2.48	3.09	2.8	0.1
Average sentence length	70	3.9	24.5	11.6	3.2
Atesman Readability Index	70	25.2	74.5	54.8	9.4
Readability level		Grade 7-8	Graduated from Graduate degree	Grade 11-12	

TABLE 5: Readability level.

	f	%
Grade 7-8	4	5.7
Grade 9-10	12	17.1
Grade 11-12	38	54.3
Grade 13-14	12	17.1
Graduate form undergraduate degree	2	2.9
Graduate form graduate degree	2	2.9

information first rather than a doctor.¹⁰ For individuals to be able to understand this knowledge, it must be properly understood and turned into valuable information. It is crucial that the material on the internet is understandable during this stage. In the 1800s, the term “readability” first appeared in America.¹¹ The reader’s ability to follow a text published in a language is referred to as readability. A text created in English should be written with short sentences and few syllables so that a reader with 6-8 years of schooling may easily read it.¹² Turkish, an attached language, has a readability value that is not solely dependent on the length of the sentence and the amount of syllables in the words. As a result, Turkish coefficients have been added to the readability formulas created for English.⁷

It is seen that patients use the internet very actively to access information not only in our country, but all over the world; a study conducted in Canada showed that cancer patients could access information via the internet.¹³

It has been concluded from the studies that 75% of people who receive health-related information did not control the source of this information.¹⁴ As an illustration, a 2017 survey in our nation found that 66.3 percent of internet users in Türkiye utilized the internet to get information on their health.¹⁵ Considering these results,

the accuracy and control of the information on the internet is extremely important.

On the other hand, it should be considered that the findings are valid for a limited population, since our analysis has been conducted only with Turkish keywords and with websites in Türkiye.⁹

CONCLUSION

Turkish texts on orthognathic surgery were found to have a moderately difficult level of readability online (54.8±9.4). However, this value is excessive when taking into account Türkiye overall population profile. Although the manuals provide ample information about the surgical procedure, they fall short when it comes to explaining potential problems. Additionally, the intended effect won’t be felt by the reader if the sufferers don’t understand it. Orthognathic surgery texts should be revised by professional associations and public health organizations while taking the readability criteria into account.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

This study is entirely author's own work and no other author contribution.

REFERENCES

1. Boyers LN, Quest T, Karimkhani C, Connett J, Dellavalle RP. Dermatology on YouTube. *Dermatol Online J.* 2014;20(6):13030/qt5037g18h. [Crossref] [PubMed]
2. Vance K, Howe W, Dellavalle RP. Social internet sites as a source of public health information. *Dermatol Clin.* 2009;27(2):133-6, vi. [Crossref] [PubMed]
3. TÜİK [Internet]. Hanehalkı bilişim teknolojileri kullanımı araştırması 2020. [25 August 2020] Erişim linki: [Link]
4. Kaya DI. Readability and content assessment of patient information texts on oral cancers found on Turkish websites. *International Dent Res.* 2021;11(Suppl 1):91-5. [Crossref]
5. Özkeskin T, Genç A, Turgut CT, Yaltirik M. Ortognatik cerrahi uygulanan hastalarda postoperatif komplikasyonların yönetiminde alternatif stratejiler. 2020;2(1)36-45. [Link]
6. Albright J, de Guzman C, Acebo P, Paiva D, Faulkner M, Swanson J. Readability of patient education materials: implications for clinical practice. *Appl Nurs Res.* 1996;9(3):139-43. [Crossref] [PubMed]
7. Ateşman E. Measuring readability in Turkish. *AU Tömer Lang.* 1997;58:71-4. [Link]
8. Çoban A. Okunabilirlik kavramına yönelik bir derleme çalışması [The review towards the concept of redeability]. 2014;1:96-111. [Link]
9. Akbulut AS. Readability analysis of information on the internet about clear aligner treatment. *Necmettin Erbakan Univ Dent J.* 2022;4(1):7-11. [Crossref]
10. Kim K, Kwon N. Profile of e-patients: analysis of their cancer information-seeking from a national survey. *J Health Commun.* 2010;15(7):712-33. [Crossref] [PubMed]
11. Dubai WH. The principles of readability. *CA Impact Inf.* 2004. [Link]
12. Bezirci B, Yılmaz AY. Metinlerin okunabilirliğinin ölçülmesi üzerine bir yazılım kütüphanesi ve Türkçe için yeni bir okunabilirlik ölçütü [A software library for measurement of readability of texts and a new readability metric for Turkish]. *DEU FMD.* 2010;12(3):49-62. [Link]
13. Chen X, Siu LL. Impact of the media and the internet on oncology: survey of cancer patients and oncologists in Canada. *J Clin Oncol.* 2001;19(23):4291-7. [Crossref] [PubMed]
14. Dilaver E, Kılınc DD. Evaluation of quality and reliability of websites about orthognathic surgery using Google Trends™ application. 2020;10(1):46-9. [Crossref]
15. Bavbek NC, Tuncer BB. Information on the internet regarding orthognathic surgery in Turkey: is it an adequate guide for potential patients? *Turk J Orthod.* 2017;30(3):78-83. [Crossref] [PubMed] [PMC]