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Investigation of Readability and Quality Levels of Online Patient Information Texts Related to Jaw Cysts

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ABSTRACT

Aim: The internet is frequently utilized as a resource for accessing health-related information, contributing significantly to health literacy. With the proliferation of internet usage, it has become evident that the majority of hospitals maintain websites, which serve as platforms for disseminating information to individuals regarding healthcare professionals, medical conditions, and treatment options. This study aims to assess the readability and quality of patient information texts about jaw cysts available on the internet.
Materials and Methods: In May 2023, patient information texts relating to "jaw cysts" from 62 out of the initial 120 websites retrieved through the Google search engine (Google LLC, Mountain View, California, USA) were assessed for readability and quality. Readability levels of the texts were determined using the "ARI(ARI)", while the quality assessment was conducted utilizing the DISCERN scale. Statistical analysis was performed using SPSS 23 (SPSS Inc., Chicago, IL, USA).
Results: According to the ARI, 50% (31 websites) of the patient information texts available on the internet were assessed at the 11-12 grade level, with 85.5% (53 websites) categorized as of medium difficulty. Additionally, based on the DISCERN scale assessment, 46.7% (29 websites) of the texts were rated as poor in quality.
Conclusion: In the creation of patient information texts concerning jaw cysts on the internet, it is imperative to take into account our society's health literacy levels. There is a pressing need for the development of higher quality and more readable texts to effectively disseminate information to the public.

Çene Kistleri ile İlgili Çevrim İçi Hasta Bilgilendirme Metinlerinin Okunabilirlik ve Kalite Düzeylerinin Araştırılması

Makale Bilgisi

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Sağlık okuryazarlığı,
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ÖZET

Amaç: İnternet, sağlık okuryazarlığında bilgiye ulaşmak için sıklıkla başvurulan kaynaklardan biridir. İnternet kullanımının artmasıyla birlikte çoğu hastanenin web sitesine sahip olduğu ve bu web sitelerinin bireylere doktorlar, hastalıklar ve tedavi seçenekleri hakkında bilgi verdiği görülmektedir. Bu çalışmadaki amaç, internet ortamında yer alan çene kistleri ile ilgili hasta bilgilendirme metinlerinin okunabilirliğini ve kalite düzeylerini araştırmaktır.
Materyal ve Metod: "Çene kistleri" terimi kullanılarak, Google (Google LLC, Mountain View, California, USA) arama motoru üzerinden çıkan ilk 120 web sitesinden 62'sideki hasta bilgilendirme metinleri okunabilirlik ve kalite açısından Mayıs 2023'te değerlendirildi. Metinlerin okunabilirlik düzeylerini hesaplamak amacıyla "Ateşman Okunabilirlik İndeksi" kullanılırken, kalite değerlendirmesinde ise DISCERN ölçeğinden yararlanıldı. İstatistiksel değerlendirme için SPSS 23 (SPSS Inc., Chicago, IL, ABD) programı kullanıldı.
Bulgular: Ateşman Okunabilirlik indeksine göre internet ortamında bulunan hasta bilgilendirme metinlerinin %50'sinin (31 web sitesi) 11-12 sınıf düzeyinde ve %85,5'in (53 web sitesi) orta zorlukta olduğu ve DISCERN ölçeğine göre metinlerin %46,7'sinin (29 web sitesi) zayıf ölçekte olduğu görüldü.
Sonuç: Çene kistleri ile ilgili internet ortamında yer alan hasta bilgilendirme metinleri hazırlanırken toplumumuzun sağlık okuryazarlığı dikkate alınıp daha kaliteli ve okunabilir metinler oluşturulmalıdır.

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INTRODUCTION

Health literacy encompasses an individual's capacity to access, comprehend, and apply patient education materials and information in making informed health-related decisions.[1] Individuals grappling with health issues often resort to the Internet to seek information concerning disease diagnosis, treatment modalities, and associated outcomes.[2,3]

In recent years, the internet has emerged as a crucial source of health-related information. Patients utilize online resources to access medical information, alleviate concerns and anxieties, and optimize time efficiency through internet-based patient education materials.[4] Consequently, the readability levels of websites containing health-related content hold significant importance.[5] Readability, a concept assessing the comprehensibility of text based on its writing style, plays a pivotal role in evaluating text readability levels.[6] Readability in a given language can be quantified using formulas specifically designed for that language. In the Turkish context, two readability formulas have been developed by Ateşman and Bezirci-Yılmaz, respectively.[7,8]

In addition to text readability, the accuracy and informativeness of content hold paramount importance. The capacity of individuals to make informed and reliable decisions regarding health matters is directly correlated with the accuracy of the information they access.[9] Given that the quality of text on websites is not consistently regulated, there exists a risk of encountering inaccuracies. Consequently, information obtained online may lead to misinformation and potentially detrimental effects on health-related decision-making.[10,11] To address this issue, systematic and scientifically grounded scales such as DISCERN and JAMA have been developed to evaluate the quality of texts.[12,13]

Jaw cysts represent one of the most prevalent lesions affecting the maxillofacial region, impacting the jaws, and are categorized into two main groups: odontogenic and non-odontogenic cysts, depending on the epithelium from which they originate. These cysts typically contain semi-liquid or liquid contents, partially or completely enclosed by the epithelial lining.[14,15] Clinically, they often manifest as painless growths, progressing slowly without apparent symptoms, potentially leading to asymmetry and facial deformities. Pain may arise in cases of cyst infection.[16] Radiographically, jaw cysts typically exhibit a radiolucent appearance with smooth and well-defined margins, typically presenting as round lesions in the maxilla and oval lesions in the mandible, often accompanied by a radiopaque border surrounding the radiolucent area.[17] Treatment modalities for these cysts include enucleation, decompression or marsupialization, combined methods, and curettage following enucleation.[14,18]

In the literature search conducted, no prior study examining the readability and quality levels of patient information texts available on the internet concerning jaw cysts was identified. Hence, this study represents the first attempt to investigate this aspect.

MATERIALS AND METHODS

In this study, conducted in May 2023, we evaluated texts from the first 120 websites obtained through the Google (Google LLC, Mountain View, California, USA) search engine using the Turkish keyword "jaw cysts" to assess their readability and quality levels. The selection of the top 120 websites was consistent with previous research methodologies (19,20). Exclusion criteria encompassed commercial websites primarily featuring videos and images, forum and chat platforms, websites providing less than 15 sentences of information,

subscription-based websites, platforms prohibiting data copying, and academic articles. Consequently, 58 websites were excluded, leaving 62 websites for evaluation. A readability analysis of the texts was performed using the ARI, while content quality assessment was conducted utilizing the DISCERN scale.

ARI

The ARI, developed by Ateşman in 1997, is based on the Flesch Ease of Reading formula.[7] The formula used to calculate the readability score is as follows:

Readability score=198.825-40.175xword length (total syllables / total words)-2.610xsentence length (total words / total sentences).

According to this formula, the readability of the text is categorized as follows:

"Very easy" if the score falls within the range of 90-100,

"Easy" if the score falls within the range of 70-89,

"Moderate difficulty" if the score falls within the range of 50-69,

"Difficult" if the score falls within the range of 30-49,

"Very difficult" if the score falls within the range of 1-29.[7]

DISCERN Scale

The DISCERN scale represents the first standardized measurement tool designed to evaluate the quality of written information texts about any health issue available on the internet. This scale comprises three sections, each consisting of 16 questions rated on a scale of 1-5. The first section comprises eight questions focusing on the reliability and sourcing of information contained within the texts, the second section comprises seven questions centering on treatment options, and the third section includes a single question assessing the overall quality of the text.[13]

Consequently, the DISCERN score ranges from 16 to 80. Based on the score outcomes, ratings are categorized as follows: 63-80 as "excellent", 51-62 as "good", 39-50 as "medium", 28-38 as "poor", and 16-27 as "very poor".[13]

During the quality assessment process, an independent evaluation was conducted by a professor specializing in oral and maxillofacial surgery along with a research assistant in the same field. Each evaluator scored the responses to the questions independently. The scores provided by both evaluators were then anonymously submitted to the statistical unit.

STATISTICAL ANALYSIS

Statistical analysis was performed using the SPSS 23 software package (SPSS Inc., Chicago, IL, USA). Descriptive statistics including minimum, maximum, mean, and standard deviation values were computed for the data obtained from the readability analysis. The Kolmogorov-Smirnov test was utilized to assess the normality distribution of the data.

In the evaluation of texts quality, the scores assigned by the researchers were averaged, and subsequent statistical analysis involved calculating the Pearson correlation coefficient.

RESULTS

The study comprised 62 websites, of which 39 (63%) were private dental clinics, 18 (29%) were private oral and dental polyclinics, and 5 (8%) were private medical hospitals. Table 1 presents the minimum, maximum, mean, and standard deviation statistical values of online patient information texts regarding jaw cysts. The distribution of readability difficulty levels of the texts is illustrated in Figure 1. Furthermore, the alignment of the texts with various readability levels was distributed as follows: 8th grade (4, 6.5%), 9-10th grade (23, 37.1%), 11-12th grade (31,

50%), 13-14th grade (3, 4.8%), and undergraduate graduate (1, 1.6%).

Table 1: Statistical values of the data

	N	Minimum	Maximum	Mean	Std. Deviation
Number of words	62	166.00	1356.00	456.483	284.849
Number of characters	62	312.00	10708.00	3483.903	2224.447
Difficult Number of words	62	166.00	1347.00	453.854	282.951
Number of Unique Words	62	22.00	734.00	284.274	144.492
Number of Short Words	62	23.00	244.00	75.306	54.565
Characters without spaces	62	1042.00	9317.00	3071.354	1896.608
Number of sentences	62	17.00	134.00	43.225	30.450
Number of paragraphs	62	5.00	68.00	19.161	13.882
The average word in length	62	2.52	3.05	2.747	0.110
The average sentence length	62	7.80	19.30	11.161	2.154
Ateşman Readability Index	62	36	73.8	59.298	50.953

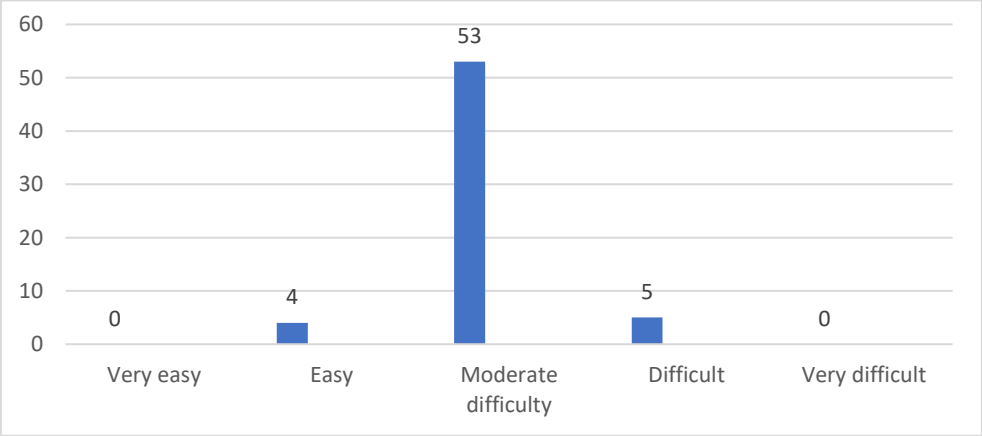

Figure 1: According to the readability scoring of the data, it was observed that patient information texts predominantly fell within the category of medium difficulty, accounting for 85.5% of the texts.

The Kolmogorov-Smirnov test was employed to assess the normality distribution of various parameters including the number of words, number of characters, number of difficult words, number of unique words, number of short words, number of characters without spaces, number of sentences, number of paragraphs, average sentence length, and ARI.

The data distribution for the ARI exhibited conformity to the normal distribution, as indicated by a p-value of 0.200, which is greater than the significance level of 0.050. However, the data distribution of the other parameters did not demonstrate normality, as evidenced by the normality test results presented in Table 2.

Table 3 shows the average scores given by two different authors for the quality assessment questions regarding the texts across the websites analyzed in the study. The DISCERN score obtained from the average scores given by the authors is determined to be 36.09. According to the distribution of DISCERN scores, 29 websites (46.7%) were categorized as poor, 22 (35.4%) as medium, 6 (9.6%) as very poor, and 5 (8.3%) as good, with

none of the websites being evaluated as excellent.

Table 2: Normality test results of the data

	Statistics	p-value
Number of Words	0.237	0.000
Number of Characters	0.230	0.000
Number of Difficult Words	0.239	0.000
Unique Word Count	0.203	0.000
Number of Short Words	0.245	0.000
Characters without spaces	0.228	0.000
Number of Sentences	0.220	0.000
Number of Paragraphs	0.182	0.000
Average Sentence Length	0.125	0.017
Ateşman Readability Index	0.072	0.200

Table 3: Based on the analysis conducted between the ratings of the two authors, since the p-value = 0.693 > 0.050, no significant difference was found. Furthermore, in the consistency analysis between the two authors, the consistency coefficient is 0.976 (p-value = 0.000 < 0.050), indicating a significant and quite high level of agreement.

	Author 1	Author 2	Mean	Statistics
1-) Are the objectives clearly stated?	3.51	3.25	3.38	
2-) Does it achieve its objectives?	3.27	3.1	3.19	
3-) Is the text relevant?	2.89	2.97	2.93	
4-) Does it indicate which sources are referenced?	1.05	1.05	1.05	
5-) Is it specified when the information in the text was written?	1.49	1.47	1.48	
6-) Is the information balanced and unbiased?	2.44	2.13	2.29	
7-) Does it share details of additional support and sources of information?	1.2	1.12	1.16	Test value = 0.398
8-) Does it address situations of uncertainty?	2.05	2.29	2.17	
9-) Is it explained how each of the treatment methods will be carried out?	2.34	2.13	2.24	p-value = 0.693
10-) Are the benefits of each treatment described?	2.42	2.16	2.29	
11-) Are the potential risks of each treatment mentioned?	1.76	1.63	1.7	
12-) Is information given about what will happen if no treatment is provided?	2.6	2.52	2.56	
13-) Is the impact of treatment methods on quality of life explained?	2.21	2.07	2.14	
14-) Does the information indicate that there can be more than one treatment choice?	2.81	2.92	2.87	
15-) Does the shared information offer assistance for decision-making?	2.37	2.21	2.29	
16-) Assessment of the overall quality of the text.	2.41	2.29	2.35	
The DISCERN score	36.88	35.31	36.09	

DISCUSSION

Health literacy is an evolving concept that intersects health and literacy, aiming to empower individuals with the skills and knowledge necessary to navigate health-related information effectively. Our literacy levels not only directly impact our capacity to comprehend and act upon health information but also influence our ability to assert greater control over our health outcomes.[19,20] Therefore, initiatives aimed at enhancing general literacy are poised to positively impact health literacy as well.

The proliferation of internet usage, commonly employed as the primary avenue for accessing health-related information, has resulted in the widespread adoption of websites by the majority of hospitals. These websites function as platforms for disseminating information to individuals concerning

healthcare providers, medical conditions, and treatment options. Furthermore, numerous other websites dedicated to providing health information exist, adding to the complexity of accessing accurate information for patients.[4,21] Notably, all websites examined in the study were found to belong to private institutions, typically with some degree of promotional content regarding treatment methods. Similar studies in the field of dentistry have also observed a predominance of websites affiliated with private institutions [22-24] This underscores a notable deficiency, as institutions such as university hospitals and state hospitals often lack patient information texts on their websites. It is imperative to address this gap by incorporating informative texts about conditions like jaw cysts on the websites of non-commercial entities, enabling patients to access valuable information.

Health professional organizations in the United States recommend preparing patient education materials at an appropriate reading level, ideally targeting 6th grade or below.[25,26] However, according to the 2022 Human Development Report by the United Nations Development Program, the average education period in Turkey is 8.7 years.[27] In this study, it was observed that based on the ARI, 50% (31 websites) of patient information texts were at the 11-12 grade level, with 85.5% (53 websites) falling into the medium difficulty category. Similar findings have been reported in other studies on readability.[22,23,28] These readability levels surpass the health literacy levels of individuals in our country. Therefore, efforts to enhance health literacy in Turkey need to be intensified.

Health-related patient information texts on the internet must align with the literacy level of individuals to ensure comprehensibility.[29] Lengthy words and sentences can hinder the creation of meaning, thereby decreasing text comprehensibility.[30] According to Ateşman, the average word length in Turkish is 2.6 syllables, and the average sentence length is 9-10 words.[7] However, the average word length (2.747) and average sentence length (11.161) of the texts analyzed in this study exceed these averages. By reducing these parameters, texts that are easier to read and understand can be created.

Another critical criterion for evaluating online health information is the quality assessment of the presented text. DISCERN is a widely used scale for assessing content quality, particularly in the context of treatment decision-making.[13] This scale assigns grades to websites based on various quality criteria, offering a quantitative assessment of publications related to health services.[31,32] In this study, it was observed that 46.7% (29 websites) of the patient information texts analyzed using DISCERN fell into the poor category. Specifically, these texts generally lacked specified reference sources (mean score: 1.05), failed to provide additional support and information sources (mean score: 1.12), and did not include publication dates (mean score: 1.48). Patients reading these poorly rated texts, which lack specified references and publication dates, may experience confusion and develop distrust toward healthcare providers.

With this study, it is anticipated that various interventions can be implemented to improve the readability and quality of patient information texts available on the Internet, ultimately benefiting both physicians and patients. However, the study does have several limitations. These include the fact that the data search was conducted within a specific timeframe, a single search engine was utilized, only the term "jaw cysts" was used as a keyword, and websites from a single country's data network were considered.

CONCLUSION

Patient information texts concerning jaw cysts on the internet should be meticulously crafted, drawing upon current and accurate sources of information. Additionally, the readability level of these texts should be tailored

to match the literacy level prevalent in our society. By adhering to these principles, it becomes possible to create high-quality texts that effectively fulfill their intended purpose. Ultimately, this approach can help reduce confusion among patients, thereby fostering trust and strengthening patient-physician relationships.

Ethical Approval

Since sources obtained from humans or animals were not used in this study, ethics committee approval was not obtained.

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Conflict of Interest

The authors deny any conflicts of interest related to this study.

Author Contributions

Design: UD, HK, Data collection and processing: UD, YA, Analysis and interpretation: UD, HK, YA, Literature review: UD, HK, Writing: UD,YA.

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