

Evaluation of Readability and Reliability of Turkish Websites on Low Back Pain

Bel Ağrısı ile İlgili Türkçe Web Sitelerinin Okunabilirliği ve Güvenilirliğinin Değerlendirilmesi

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ÖZET

AMAÇ: Bu çalışmada bel ağrısı konusunda bilgilendirme içeren Türkçe internet sitelerinin okunabilirlik ve güvenilirlik düzeylerini ortaya koymayı amaçladık.

GEREÇ VE YÖNTEM: Şubat 2022'de Google'ın arama motoruna (<https://www.google.com>) "bel ağrısı" kelimesi yazılarak arama yapıldı. Ticari siteler, reklam siteleri, sohbet siteleri, forum siteleri, magazin siteleri, sadece resim veya video içeren siteler ve 10 cümleden az cümle içeren siteler çalışma dışı bırakıldı. Ortalama hece sayısı, ortalama 4 ve daha fazla heceli kelime sayısı ve Ateşman ve Bezirci-Yılmaz okunabilirlik, JAMA ve DISCERN skorları ile güvenilirlik değerleri hesaplanmıştır.

BULGULAR: Ortalama hece sayısı ve 4 ve daha fazla heceli ortalama kelime sayısı sırasıyla 2,78 (1,68-3,20) ve 3,74 (0,36-6,31)'dir. Median Ateşman, Bezirci-Yılmaz, okunabilirlik değerleri sırasıyla 56,10 (29,77-100,00) ve 12,80 (1,88-20,01); JAMA ve DISCERN güvenilirlik skorları sırasıyla 1.06 (0-2), 43,00 (26,00-67,00) idi.

SONUÇ: Bu çalışma sonucunda bel ağrısı ile ilgili bilgilendirme içeren Türkçe internet sitelerindeki metinlerin okunabilirlik oranı, kalite ve güvenilirliğinin oldukça düşük seviyede olduğu sonucuna ulaşıldı.

Anahtar Kelimeler: bel ağrısı, okunabilirlik, güvenilirlik, internet

ABSTRACT

OBJECTIVE: In this study, we investigated the readability and readability of Turkish websites containing information about low back pain.

MATERIALS AND METHODS: In February 2022, a search was performed by typing the word "low back pain" into Google's search engine (<https://www.google.com>). Commercial websites, advertising sites, chat sites, forum sites, magazine sites, sites containing only images or videos, and sites with fewer than 10 sentences were excluded from the study. Reliability scores were calculated using the mean syllable count, the mean number of words with 4 or more syllables, and Ateşman's and Bezirci-Yılmaz's scores for readability, JAMA, and DISCERN.

RESULTS: The mean number of syllables and words with 4 or more syllables was 2.78 (1.68-3.20) and 3.74 (0.36-6.31), respectively. The mean Ateşman, Bezirci-Yılmaz, and readability scores were 56.10 (29.77-100.00) and 12.80 (1.88-20.01), respectively, and the JAMA and DISCERN reliability scores were 1.06 (0-2) and 43.00 (26.00-67.00), respectively.

CONCLUSION: As a result of this study, it was found that the readability, quality, and reliability of texts on Turkish websites containing information about low back pain are at a very low level.

Keywords: low back pain, readability, reliability, internet

INTRODUCTION

Low back pain usually occurs between the bottom of the ribs and the top of the lower gluteal folds, often accompanied by leg pain. It is seen at a high rate of 70-80% during life (1,2). It can recur in 70% of patients (3). Low back pain affects not only patients but also the whole society, as it leads to a loss of working capacity(4). Due to the complex

anatomical structure, neighborhood, and functional characteristics of the waist, many etiologic factors can cause pain. In addition to mechanical, infectious, and malignant causes, reasons such as job dissatisfaction and psychological stress can also lead to low back pain (5,6). Clearly, the prognosis and treatment of low back pain, which can occur for a variety of reasons, vary.

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In light of technological developments, as our daily lives change, so do the ways in which we obtain information. As of December 2018, it is known that there were over 4.1 billion Internet users in the world (7). People have started to use the Internet frequently in the field of health to get information about diseases, learn about the diagnosis and treatment process, evaluate/control the doctor's recommendations in own perceptual world, and clarify many questions and doubts in their minds (8). It has been reported that more than half of the adult population in the United States and Germany use the Internet for health information (9,10).

It is not easy for individuals to process general, non-patient-specific information on the Internet and adapt it to their own health status. For this information to be useful in the boot, it must be understandable and reliable. Unreliable, unintelligible, and unreadable information without any controls or monitoring mechanisms does more harm than good and leads to difficulties in the doctor-patient relationship (10,11). Studies of the reliability of health information on the Internet have found that the degree of reliability is low (10,12).

Information on the internet must be readable and understandable as well as reliable. The value of medical information provided for informational purposes depends on the ability of patients to understand it. Readability is a concept that expresses the 'ease or difficulty of understanding' texts by readers. Readability, which is a language-specific situation, is directly related to an individual's level of education and health literacy. Factors such as sentence length, number of syllables, and frequency of synonym use affect readability. In a study conducted in Türkiye in 2014, it was found that 64.6% of the population had inadequate health literacy. According to the report published in 2019, the average duration of education in Turkey was reported to be 7.7 years (13,14). In studies that analyzed the degree of readability of Turkish texts on various health-related topics according to the readability formula of Ateşman and Yılmaz-Bezirci, it was reported that the degree of readability of websites is insufficient (13,15-17).

There is no study in the literature that investigates the status of Turkish websites related to low back pain. In this study, we aimed to determine the degree of readability and reliability of Turkish websites with information about low back pain. If these websites are found to be inadequate in

terms of readability and reliability, this should be revealed and remedial studies should be conducted in this regard.

MATERIAL & METHODS

Approval for the study was obtained from the Scientific Ethics Committee of the University of Health Sciences, Hamidiye Faculty of Medicine (Ethics Committee Protocol No: 21/674). Using the keyword "low back pain" in the Google search engine (www.google.com), a total of 150 websites were scanned in the first 15 pages in February 2022, as in previous similar studies (10). Commercial sites, sites with chat forms, advertising sites, magazine sites, sites containing only pictures or videos, news sites that did not contain information about the disease, and sites with fewer than 10 sentences were excluded. The websites to be included in the study were divided into two groups depending on the creator: 1.) Hospitals, universities, health professionals, created by health-related associations or other official institutions 2.) News sites, others (blog, anonymous, etc.).

It was investigated whether information on the definition, causes, clinical features, and treatment of low back pain could be found on the websites accessed with the given keyword. In addition, the average number of words, the average number of syllables, and the average number of words with 4 or more syllables were calculated using a computer program. The readability formulas of Ateşman and Bezirci-Yılmaz were used to calculate the degree of readability of the information texts on the websites, and the ratings of the Journal of The American Medical Association (JAMA) - Quality Criteria for Consumer Health Information (DISCERN) were used to evaluate the reliability of the information.

Ateşman readability value:

It is a formula developed by Ateşman by adapting the Flesch Reading Ease (18) formula into Turkish and based on the length of syllables, words, and sentences in the text (15).

Readability value: $198,825 - 40.175 \times (\text{total syllables} / \text{total words}) - 2,610 \times (\text{total words} / \text{total sentences})$.

According to Ateşman, the readability ranges in Turkish are as follows:

• Ateşman Value	Readability Range
• 90-100	Very easy
• 70-89	Easy

- 50-69 Moderate
- 30-49 Difficult
- 1-29 Very difficult

Bezirci-Yilmaz readability value:

Bezirci and Yilmaz; developed a new readability formula in 2010 based on previously developed readability scales and specific features of the Turkish language (16). It is calculated based on the sentence lengths in the texts (the number of words in the sentences) and the number of syllables in the words. The readability of the texts decreases when the sentence lengths in the texts and the number of syllables in the words increase. The values obtained from the formula correspond to a certain year of education in our country.

YOD: $\sqrt{OKS * ((H3 * 0.84) + (H4 * 1.5) + (H5 * 3.5) + (H6 * 26.25))}$

YOD: New Readability Value

OKS: Average number of words in a sentence

H3: Average number of three-syllable words in a sentence

H4: Average number of four-syllable words in a sentence

H5: Average number of five-syllable words in a sentence

H6: Average number of six-syllable words in a sentence.

JAMA Criteria:

The JAMA benchmark criteria are used to measure the reliability, relevance, transparency, and usefulness of manuscripts (19). The assessment examines 4 parameters: 1) author details 2) source statement, reference, and citations 3) date, last update information 4) whether there are any related disclosures (sponsorship, conflicts of interest, partnerships with for-profit organizations, etc.). 0 (none), depending on whether each criterion is present or not; It is scored 1 (yes) point. The total score ranges from 0-4; a score of 3 or more indicates high reliability, while less than 2 points indicates low reliability.

DISCERN Score:

DISCERN was created by a group of experts from England to assess the reliability and quality of texts and the appropriateness of treatment options (20). It consists of three parts, in the first part there are 8 questions to measure reliability and dependability, in the second part there are 7 questions about the adequacy of treatment options. The last question in the third part is: it asks about overall quality independent of the other 15 questions. Each question is scored from 1 to 5, from "no" to "yes." An absolute affirmative will earn 5 points, an absolute negative

will earn 1 point, or 2-4 points depending on how many times you answered the corresponding question. A score of 63-75 is excellent, a score of 51-62 is good, a score of 39-50 is moderate, a score of 27-38 is inadequate, and a score of 16-26 is very unsatisfactory.

Statistical Analysis

SPSS® 21 software (IBM Inc, USA) was used for data analysis. Descriptive statistics of categorical data in the study were presented using frequency and percentage values, and numerical data were presented using median (min-max) values. Whether the groups in the study were normally distributed was determined using the Shapiro-Wilks Test. Mann-Whitney U Test was used for numerical data comparisons between independent groups, and the Chi-Square test was used for categorical data comparisons. All statistical analyzes used in the study were performed bilaterally, with a 5% significance limit and 95% confidence interval.

RESULTS

Of the total 150 sites, 79 sites were included in the study because they met the inclusion criteria. Of these sites, 55 (69.6%) were in the first group and 24 (30.4%) were in the second group.

When the readability ranges of all sites included in the study are examined according to Ateşman, 3 (3.8%) of them were "very difficult", 24 (30.4%) were "difficult", 48 (60.8%) were "moderate", 2 (2.5%) were classified as "easy", and 2 (2.5%) were classified as "very easy". There was no statistically significant difference between the readability intervals of the study groups according to Ateşman (p=0.099) (Table 1).

Table 1. Evaluation of the readability ranges of the study groups according to Ateşman

Ease of read	Group 1 n(%)	Group 2 n(%)	p
Very difficult + difficult	22 (%40,0)	5 (%20,08)	
Medium + easy + very easy	33 (%60,0)	19 (%79,2)	0,099

p: Chi square test p value

The median average number of words in a sentence of all sites included in the study was 13.04 (2.75-23.84), the median number of syllables in a word was 2.78 (1.68-3.20), four or more syllables in a sentence median was 3.74 (0.36-

6.31), Ateşman readability median was 56.10 (29.77-100.00), Bezirci-Yılmaz readability median was 12.80 (1.88-20, 01)' (Table 2), JAMA median value was 1.06, DISCERN part 1 median was 26.00 (15.00-33.00), DISCERN part 2 median was 17.00 (7.00-30.00), the median of DISCERN total value was 43.00 (26.00-67.00) (Table 3). The Ateşman readability range of all sites included in the study was classified as "medium" difficulty. The Bezirci-Yılmaz readability score of all the sites included in the study corresponds to the undergraduate level in the Turkish education and training system.

Table 2. Comparison of the readability values of the study groups

	Group 1 (n=55)	Group 2 (n=24)	p
Average word count in sentence	13,25 (9,06-23,84)	12,28 (2,75-23,84)	0,314
Average number of syllables in words	2,79 (1,68-3,20)	2,76 (1,68-2,93)	0,270
The average number of words containing four or more syllables in the sentence	3,76 (2,19-6,31)	3,36 (0,36-5,38)	0,164
Ateşman	53,54 (29,77-74,38)	59,74 (34,55-100,00)	0,065
Bezirci-Yılmaz	12,89 (7,59-20,01)	11,45 (1,88-20,01)	0,201

Mann-Whitney U Test

Table 3: Comparison of DISCERN and JAMA values of study groups

	Group 1 (n=55)	Group 2 (n=24)	p
Discern 1. Part*	24 (15-33)	29 (16-33)	0,019
Discern 2. Part*	16 (7-27)	19 (7,0-30)	0,191
Discern Total ¹	42 (26-60)	48 (26-67)	0,071
JAMA** 0	9 (%16,4)	1 (%4,2)	
JAMA** 1	37 (%67,3)	17 (%70,8)	
JAMA** 2	9 (%16,4)	6 (%25,0)	

*Mann-Whitney U Test, results are expressed as median (minimum-maximum) ** Chi square test, results are expressed as n (%)

The average number of words in the sentence (p=0.314), the average number of syllables in the words (p=0.270), the average number of words with four or more syllables in the sentence (p=0.164), Ateşman readability scores (p=0.065), Bezirci- Yılmaz readability scores (p=0.201) were not significantly different (Table 2).

DISCUSSION

Low back pain is a health problem that affects the general population, leading to absenteeism from work and frequent use of health services. In studies conducted in our country, a lifetime prevalence of 51-86.30% was found (21-24).

With technological development, health information provided by physicians and medical personnel have become available from many different sources (25,26). The Internet and television, which are widely used in daily life, are the main sources for obtaining health information (27). With the widespread use of the Internet, information seekers encounter not only information provided by a single source but also user-produced content. Among the various sources of information, people may be confused about their diseases and treatment methods. The readability of text on websites should be correlated with people's level of education. The reliability of information available from a variety of sources is important to people when making decisions about their health status and treatment.

In the study in which Çiftçi et al. evaluated the readability of Turkish websites on drug addiction, they found that the degree of readability of the texts was "difficult" according to Ateşman and "undergraduate" according to Bezirci-Yılmaz (28). In the study in which Solak et al. evaluated the readability of Turkish websites about smoking cessation, they found that the readability range of the texts on the websites was "difficult" according to Ateşman, and "undergraduate" according to Bezirci-Yılmaz, and these results were significantly higher than the educational level of our people. stated that (29). In the study of Deniz et al., in which they evaluated the readability and content of the information texts via the triple test, the readability level of the websites was found to be moderate (57.6) according to the Ateşman formula; it was found to be at the undergraduate level according to the Bezirci-Yılmaz formula (30). In Solak's study, in which he investigated the readability of websites with information about colorectal cancer, he found that the readability of the texts on the websites was above the recommended health literacy and academic level in our country, and the texts were difficult to understand (31). In our study, the readability of the websites containing information about low back pain was found to be at moderate level of difficulty according to the Ateşman formula and at the undergraduate level according

to the Bezirci-Yılmaz formula. In the study by Ayvat et al., it was found that 70.50% of patients with low back pain had primary education or less and 29.50% had high school education or higher (32). According to these results, Turkish websites with information about low back pain are above the educational level of most patients

In their study, Yüksek and Miniksar examined the quality and reliability of websites providing information on sepsis using the ratings JAMA and DISCERN. The mean score of DISCERN was found to be 36 and the median score of JAMA was found to be 2. It was found that the quality and reliability of Internet-based information on sepsis was poor (33). Ceyhan et al. evaluated the reliability of Turkish resources on diagnosis and treatment of anterior cruciate ligament rupture and reported that Turkish resources accessed through search engines on this topic were insufficient to inform patients (17). In the study of Yılmaz and Eden, in which the information on dental trauma accessed through the Internet was evaluated using the DISCERN score, they concluded that the information provided was insufficient (34). In the study of Gökay and Görürgöz, in which Turkish websites containing information on lamellar dental veneers were evaluated with the scores DISCERN and JAMA, the average score of DISCERN was 28.1, and it was found that the quality and reliability were weak (35). In the study of Pamukçu and İzci Duran, in which they examined the videos with information about gout on the Internet, the average DISCERN score was 44.43, the average JAMA score was 2.54, and it was found that the content was of low quality (35). In our study, it was found that the average DISCERN score of the websites that contained information about low back pain was 43, and the average JAMA score was 1.06, which is consistent with the literature, and it was found that the information was inadequate.

Limitations:

The study has several limitations. The results reflect this time period because the pages on the site are scanned in a given month. Since the number of sites included in the study is small, it may not be possible to generalize to the entire country.

CONCLUSION

As a result of this study, it was found that the readability, quality, and reliability of text on Turkish websites containing low back pain information are at a very low level. We

believe that it would be more beneficial if the texts on Turkish websites containing information about low back pain were of high quality, reliable and at a readable level that can be understood by the general public according to the average educational level of society.

Etik: Bu çalışmanın etik kurulu alınmıştır (No: 21/674).

Ethics committee approval had been taken (No: 21/674).

Yazar katkı durumu; Çalışmanın konsepti; EA, SK, RY, HY, İS, dizaynı; EA, SK, RY, HY, İS, Literatür taraması; EA, SK, RY, HY, İS, verilerin toplanması ve işlenmesi; EA, SK, RY, HY, İS, istatistik; EA, SK, RY, HY, İS, yazım aşaması; EA, SK, RY, HY, İS.

Author contribution status; The concept of the study; EA, SK, RY, HY, İS, design; EA, SK, RY, HY, İS, literature review; EA, SK, RY, HY, İS, collecting and processing data; EA, SK, RY, HY, İS, statistics; EA, SK, RY, HY, İS, writing phase; EA, SK, RY, HY, İS.

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