



Is the Internet Sufficient and Trustworthy for Torticollis Parents? Evaluation of Online Information for Torticollis

Tortikollis Ebeveynleri için İnternet Yeterli ve Güvenilir mi? Tortikollis için Çevrimiçi Bilgilerin Değerlendirilmesi

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ABSTRACT

Objective: The purpose of this study was to assess the readability and quality of torticollis-related web content.

Methods: The top 3 browsers were determined. The 2 reviewers structured their websites according to type. Each one's quality was determined based on whether or not it conformed to the Health On the Net (HON) code as well as using some scoring tools such as the DISCERN score, Journal of American Medical Association (JAMA) benchmark, and Global Quality score (GQS). To evaluate readability, the Flesch-Kincaid grade level (FKGL) was applied.

Results: Sixty websites were identified. The categories were as follows: 12 (20%) academic, 26 (43.3%) medical, 13 (21.7%) physician, and 9 (15%) commercial. The DISCERN, JAMA, GQS, FKGL, and Torticollis-Specific Content (TSC) scores of the academic category were significantly higher than those of the other categories. Websites with a HON code had considerably higher DISCERN, JAMA, GQS, and TSC scores than those without it ($p<0.05$).

Conclusion: Most material on the websites reviewed in this study was of low quality. Despite the higher quality of academic resources, the material was challenging to comprehend. The current study can aid in the evaluation of information that may be important for preserving equilibrium in patient-doctor relationships.

Keywords: Torticollis, internet, search engine, information

ÖZ

Amaç: Bu çalışmanın amacı, tortikollis ile ilgili çevrimiçi bilgilerin içeriğini ve okunabilirliğini değerlendirmektir.

Gereç ve Yöntem: En sık kullanılan 3 internet tarayıcısı belirlendi. İki yorumcu, web sitelerini türe göre kategorize etti. Her birinin kalitesi, Health On the Net (HON) kodunun varlığına ve yokluğuna göre ve ayrıca DISCERN puanı, Amerikan Tıp Derneği Dergisi (JAMA) kıyaslaması ve Küresel Kalite skoru (GQS) dahil iyi bilinen puanlama sistemleri kullanılarak değerlendirildi. Okunabilirliği değerlendirmek için Flesch-Kincaid derece düzeyi (FKGL) kullanıldı.

Bulgular: Altmış web sitesi belirlendi. Kategorilerin dağılımı 12 (%20) akademik, 26 (%43,3) medikal, 13 (%21,7) hekim, 9 (%15) reklam şeklindeydi. Akademik kategorisinin DISCERN, JAMA, GQS, FKGL ve Torticollis-Specific Content (TSC) puanları diğer kategorilere göre anlamlı olarak yüksek bulunmuştur. HON kodu olan web sitelerinin DISCERN, JAMA, GQS ve TSC puan değerleri, HON kodu olmayanlara göre anlamlı derecede yüksekti ($p<0,05$).

Sonuç: Bu çalışmada incelenen web sitelerindeki materyallerin çoğu düşük kalitedeydi. Akademik kaynakların daha yüksek kalitesine rağmen, materyallerini anlamak zordu. Mevcut çalışma, hasta-doktor ilişkilerinde dengenin korunması için önemli olabilecek bilgilerin değerlendirilmesine yardımcı olabilir.

Anahtar Kelimeler: Tortikollis, internet, arama motoru, bilgi

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INTRODUCTION

Even parents of children and adolescents use the Internet as a crucial source of knowledge and a platform for buying and selling personal experiences. For most countries, the internet serves as the primary way of sharing health information (1). Because of inaccurate or incomplete information, this could make the whole process and treatment more challenging. Adults trust browsers to help them identify convenient websites, and most adults believe that the data provided on these websites is reliable (2). In addition, up to 90% of consumers think that the health data they find online is dependable (3). For parents of pediatric orthopedic outpatients as well, this trend appears to make sense. Seventy-four percent of parents indicated they would propose that others use the internet for medical information (4).

The Latin words "torus" (twisted) and "collum" (neck) are the source of the name "torticollis". Torticollis is a disorder in which the sternocleidomastoid muscle becomes shorter, which causes the head to tilt to one side and the chin to rotate in the opposite direction. Torticollis is a common disorder that occurs in individuals of all ages, from newborns to adults (5). It is a symptom of a deeper disease process but does not imply a definitive disease; therefore, if it persists or is combined with other signs, further study should be conducted (6).

The literature revealed that websites about common pediatric orthopedic diseases differ considerably in their quality and content (7). We hypothesized that the content and quality of online information related to torticollis would be acceptable and sufficient. We also hypothesized that the readability of the online data would be comprehensible. To the best of our knowledge, no printed report evaluating the online data for torticollis was conducted. Hence, in the current study, we evaluated the readability, content, and quality of online resources for torticollis.

METHODS

Google, Yahoo!, and Bing, the three most popular browsers, were used to search the internet using the expression 'torticollis'. Google is the most popular browser among them, followed by Bing and Yahoo! (8). The scans were performed on the same day (August 20, 2022), and all search engine cookies were removed before scanning. Websites that appeared to be duplicates or charged a fee for information access were excluded, and 60 websites were determined. The initial step in the study was to identify the types of websites. We divided the websites into academic, physician, medical, and commercial categories.

Methods of Assessment

The DISCERN instrument, the Flesch-Kincaid grade level (FKGL), the Global Quality score (GQS), the Journal of American Medical Association (JAMA) benchmark, the Torticollis-Specific Content (TSC) score (Table 1), and the availability of the Health On the Net (HON) accreditation were used to evaluate all of the selected websites. Two reviewers assessed each resource, and any disagreements in their evaluations were examined.

DISCERN has become a reliable and verified scoring tool for assessing the value of printed public health information online (9). It comprises 16 questions, with each question

Table 1. Torticollis content score

Wry neck
Cervical dystonia
Congenital muscular torticollis
Physical therapy
Sternocleidomastoid muscle
Ultrasonography
Spasmodic torticollis
Surgery
Prognosis
Splinting
Stretching
Congenital abnormalities
Traumatic brain injury
Selective peripheral denervation
Decreased neck movement
Tremor in head
Cervical range of motion
Cervical mass
Congenital ocular torticollis
Magnetic resonance imaging
Indication
Deep brain stimulation
X-ray
Electromyogram
Pain
Acquired torticollis
Physical examination
Infant
Trouble in breastfeeding
Klippel-Feil syndrome

worth one point out of five, with 80 being the highest possible score for a website. DISCERN was created in 1999 by a group of experts and was tested on specialists and care providers (10).

The JAMA benchmark criteria evaluate websites based on four criteria: authorship, attributions, disclosure, and currency (11). Each criterion received one point, with the highest score of four points awarded for this evaluation. GQS, which employs a five-point metric to measure the value of a website, was applied to each one. The evaluations ranked the platform’s quality of information and its possible benefits to the patient (12).

Among the several methods for testing readability, FKGL and Flesch-Kincaid Reading Ease score (FKRS) are the most commonly cited (13,14). The FKGL of a written document implies that an individual having reading skills similar to those of a graduate from that ‘academic level’ would be able to read and comprehend the provided content. The FKRS determines how simple it is to understand a given topic, with scores ranging from 0 (unreadable) to 100 (very easy to read) (15). As in prior studies (16-18), the text from each website was copied to a Microsoft Word (Redmond, Washington) document to obtain FK scores.

Moreover, for quality, the status of the HON code was noted. The HON Foundation is an independent organization that was founded in 1996 to set ethical guidelines for the publication of medical information available on the Internet. It is the most frequently used web-based medical information dependability code (19).

Finally, a TSC score was developed to determine the actual content of the websites (Table 1). This necessitated a dispute between two senior orthopedic surgeons who specialized in pediatric orthopedics. Each of the predefined words related to symptoms, diagnostic instruments, and treatment preferences was awarded one point. There were no points given if the term was not mentioned. Sites were ranked between 0 and 30, with an overall score of 30 signifying the highest quality of content.

Statistical Analysis

For statistical analysis of the study findings, the IBM SPSS Statistics 22 (IBM SPSS, Türkiye) application was employed. While analyzing the data, the Shapiro-Wilks test was employed to assess the parameters’ compliance with the normal distribution. In addition to descriptive statistical models, the Kruskal-Wallis test was employed in the comparison of quantitative data to compare parameters that did not exhibit normal distribution, and Dunn’s test was performed to determine which group was concerned about

the discrepancy. The Mann-Whitney U test was used to determine the two groups of parameters that did not have a normal distribution. To examine the associations between parameters that did not comply with normal dispersion, Spearman’s rho correlation analysis was used. To determine the levels of agreement among observers, the lower and upper ranges of the intraclass correlation coefficient were determined. The significance was determined at the $p < 0.05$ level.

RESULTS

First, 60 websites were determined according to their sources: 20% were academic, 21.7% were physician, 43.3% were medical, and 15% were commercial (Figure 1). The average scores of the assessment tools are shown in Table 2.

Statistically significant differences in the DISCERN, JAMA, GQS, FKGL, FKRS, and TSC scores were detected between the categories ($p = 0.000$; $p < 0.05$). In the post hoc evaluations conducted to determine the categories from which the significance originated, the DISCERN score ($p_1 = 0.020$; $p_2 = 0.000$; $p_3 = 0.000$; $p < 0.05$), the JAMA score ($p_1 = 0.012$; $p_2 = 0.000$; $p_3 = 0.000$; $p < 0.05$), the GQS score ($p_1 = 0.012$; $p_2 = 0.000$; $p_3 = 0.000$; $p < 0.05$), the FKGL score ($p_1 = 0.001$; $p_2 = 0.000$; $p_3 = 0.000$; $p < 0.05$), and the TSC score ($p_1 = 0.018$; $p_2 = 0.000$; $p_3 = 0.000$; $p < 0.05$) of the academic category were found to be significantly higher than those of the physician, medical, and commercial categories. The FKRS score of the academic category was found to be significantly lower than that of the physician, medical, and commercial categories ($p_1 = 0.002$; $p_2 = 0.000$; $p_3 = 0.000$; $p < 0.05$) (Table 3).

We observed a 93.5% statistically significant positive correlation between the DISCERN and JAMA scores ($p = 0.000$, $p < 0.05$). A positive and statistically significant relationship was also identified at the 65.2% level between the DISCERN and FKGL scores and at the 91.4% level

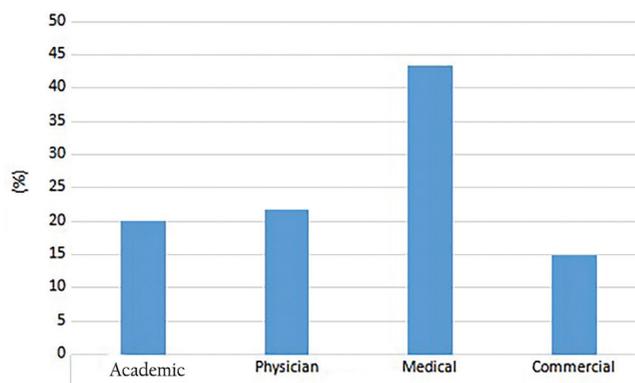


Figure 1. Distribution of websites according to sources

between the DISCERN and TSC scores ($p=0.000$, $p<0.05$) (Table 3) (Figure 2). In addition, a positive, 71.1%, and statistically significant correlation was found between the TSC and FKGL scores ($p=0.000$; $p<0.05$) and a negative,

72.3%, and statistically significant correlation was found between the FKRS and TSC scores ($p=0.000$; $p<0.05$) (Figure 3).

In addition, while 78.3% of websites did not have a HON code, 21.7% of them did. The DISCERN, JAMA, GQS, and TSC score values of websites with a HON code were found to be significantly higher than those without one ($p<0.05$). However, there appeared to be no significant difference in FKGL and FKRS scores between websites with and without a HON code ($p>0.05$) (Table 4).

Table 2. Minimum, maximum, mean and standard deviation values of the assessment tools

	Min-max	Mean \pm SD
DISCERN reviewer 1	17.6-64	34.72 \pm 12.48
DISCERN reviewer 2	17.6-64	36.8 \pm 12.96
DISCERN score	18.4-64	12.96 \pm 12.64
JAMA reviewer 1	1-4	1.97 \pm 0.97
JAMA reviewer 2	1-4	2.23 \pm 1.14
JAMA score	1-4	2.1 \pm 1.04
GQS reviewer 1	1-4	2.17 \pm 1.14
GQS reviewer 2	1-5	2.33 \pm 1.24
GQS score	1-4.5	2.25 \pm 1.17
FKGL	3.9-12	9.21 \pm 2.23
FKRS	6.6-80.8	46.63 \pm 19.54
TSC	5-30	19.38 \pm 7.92

Min-max: Minimum-maximum, SD: Standard deviation, JAMA: Journal of American Medical Association, GQS: Global Quality score, FKGL: Flesch-Kincaid grade level, FKRS: Flesch-Kincaid Reading Ease score, TSC: Torticollis-Specific Content

DISCUSSION

The internet is a fast, efficient, and unidentified source of health-related data. Finding comprehensive information, on the other hand, is complicated. Patients frequently use commercial websites to look for relevant data and are more likely to assess a website’s reliability based on its concept appearance instead of the origin of the data (20).

The findings of this study, based on analyses performed with standard assessment instruments, show that websites that are easily reachable to someone seeking information on the topic of torticollis are often of low quality. These findings are consistent with earlier orthopedic research on information quality (7,21,22). Torticollis parents encounter

Table 3. Evaluation of scores by category and evaluation of correlation between assessment tools

		DISCERN score	JAMA score	GQS score	FKGL	FKRS	TSC
		Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Category	Academical	51.04 \pm 7.36	3.5 \pm 0.52	3.88 \pm 0.43	11.87 \pm 0.32	20.62 \pm 7.81	28.08 \pm 2.43
	Physician	38.24 \pm 9.12	2.31 \pm 0.83	2.46 \pm 1.03	9.12 \pm 2.06	45.87 \pm 18.81	21.31 \pm 5.66
	Medical	31.84 \pm 10.4	1.67 \pm 0.76	1.75 \pm 0.78	8.49 \pm 2.02	54.83 \pm 14.95	17 \pm 7.38
	Commercial	22.88 \pm 7.68	1.17 \pm 0.35	1.22 \pm 0.51	7.83 \pm 1.74	58.7 \pm 10.25	11.89 \pm 5.88
	p^1	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
JAMA score	r	0.935	-	-	-	-	-
	p^2	0.000*	-	-	-	-	-
GQS score	r	0.934	0.953	-	-	-	-
	p^2	0.000*	0.000*	-	-	-	-
FKGL	r	0.652	0.660	0.659	-	-	-
	p^2	0.000*	0.000*	0.000*	-	-	-
FKRS	r	-0.653	-0.664	-0.668	-0.953	-	-
	p^2	0.000*	0.000*	0.000*	0.000*	-	-
TSC	r	0.914	0.878	0.891	0.711	-0.723	-
	p^2	0.000*	0.000*	0.000*	0.000*	0.000*	-

¹Kruskal-Wallis test, ²Spearman Rho correlation analysis, * $p<0.05$, SD: Standard deviation, JAMA: Journal of American Medical Association, GQS: Global Quality score, FKGL: Flesch-Kincaid grade level, FKRS: Flesch-Kincaid Reading Ease score, TSC: Torticollis-Specific Content

anxiety and stress associated with the diagnosis and ongoing physical therapy intervention, in addition to the usual stress factors experienced by parents of newborns (23). Although torticollis is not a life-threatening or persistent condition, all parents have concerns about its diagnosis, treatment, and possible impact on the child's well-being and growth (24). Families with children suffering from orthopedic issues can obtain information

from various sources, including online journals, personal accounts, and commercial websites. The peer review process before publication in medical journals carefully controlled information dissemination; however, in the new era of the Internet, everyone with an Internet connection and device can post information (4). This could lead to misdirection, particularly for patients seeking information on any health issue.

In the current study, the DISCERN, JAMA, GQS, FKGL, and TSC scores of the academic category were found to be significantly higher than those of the other categories, as previously reported in the literature (21,25). The sample considered in this study had an average DISCERN score of 35.68 ± 12.64 . This finding is consistent with previous research (26,27), which identified that the quality of information accessible on websites is low. Although academic resources have higher scores, this low average score could be due to websites failing to state the aim of their content and providing referenced, accurate data in their text.

The mean JAMA benchmark score was 2.1 ± 1.04 out of 4, which was similar to previous studies (22). The low JAMA scores could be attributed to the fact that most websites excluded any references or resources. We discovered a positive correlation between the JAMA benchmark criteria and DISCERN scores ($p=0.000$; $p<0.05$). This might be because the two DISCERN score questions are linked to the availability of references and the date of publication, which are both essential parts of the JAMA benchmark criteria score.

This study demonstrated that the average FKGL and FKRS scores were 9.21 ± 2.23 and 46.63 ± 19.54 , respectively. These data suggest that the FKGL result is approximately 3.5 points

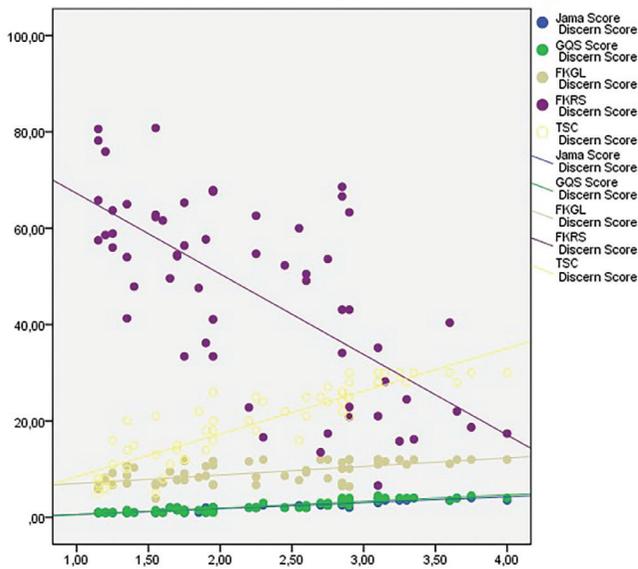


Figure 2. Relationship of DISCERN score to other scores
 JAMA: Journal of American Medical Association, GQS: Global Quality score, FKGL: Flesch-Kincaid grade level, FKRS: Flesch-Kincaid Reading Ease score, TSC: Torticollis-Specific Content

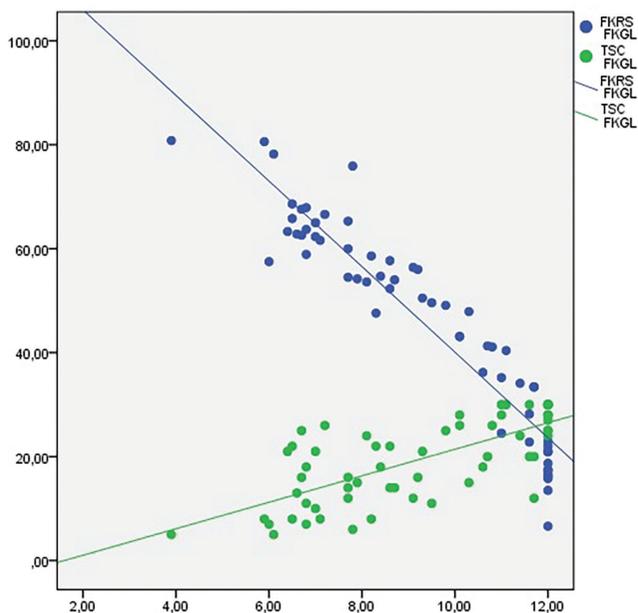


Figure 3. Relationship of TSC scores to FKGL scores and FKRS scores
 FKGL: Flesch-Kincaid grade level, FKRS: Flesch-Kincaid Reading Ease score, TSC: Torticollis-Specific Content

Table 4. Evaluation of scores based on the presence of HON code

	HON		p-value
	Absent	Present	
	Mean ± SD	Mean ± SD	
DISCERN score	33.12±12	45.12±11.04	0.004*
JAMA score	1.93±1	2.73±0.95	0.012*
GQS score	2.04±1.14	3±0.98	0.006*
FKGL	9.23±2.31	9.12±2.02	0.808
FKRS	46.19±20.18	48.18±17.7	0.747
TSC	18.17±7.93	23.77±6.38	0.020*

Mann-Whitney U test, * $p<0.05$, SD: Standard deviation, JAMA: Journal of American Medical Association, GQS: Global Quality score, FKGL: Flesch-Kincaid grade level, FKRS: Flesch-Kincaid Reading Ease score, TSC: Torticollis-Specific Content, HON: Health On the Net

higher than the sixth grade reading level proposed by the AMA and the National Institutes of Health (28). This result is similar to the findings of other studies that have evaluated the readability of information available on the Internet (29,30). The FKRS score obtained in this study signifies that the online data was “difficult to read”, implying that patients must have nearly high school level English qualifications to adequately comprehend the content of the information available on the internet.

Similar to the literature (31,32), the quality of online papers with a HON code was higher, supporting the idea that the content of websites with a HON code can be relied on to provide higher quality data. In this study, 78.3% of websites did not have a HON code, whereas 21.7% did. The content evaluated about websites with a HON code had significantly higher DISCERN, JAMA, GQS, and TSC scores than those without a HON code ($p < 0.05$). Nevertheless, no statistically significant difference in FKGL and FKRS scores was observed between websites with and without HON codes.

Because the content score used in this study was constructed from information provided by two pediatric surgeons, it may not be thorough overall. This study entirely focused on web-based paper products, but patients may also use audio-visual devices to gather information, which was not assessed in the current study. Because of the internet's ongoing evolution, search results or ranking positions may frequently change. The information quality on online platforms apart from the three most popular browsers was not evaluated in this study.

CONCLUSION

Despite a rise in the number of useful sites, most material on the websites reviewed in this study was of low quality, which agrees with previous studies. Despite the higher quality of several websites, particularly academic resources, their material was challenging to comprehend. This is, to the best of our knowledge, the first study of its kind on torticollis. In this regard, the current study can aid in the evaluation of information that may be important for preserving equilibrium in patient-doctor relationships.

ETHICS

Ethics Committee Approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent: The study does not require patient consent.

Authorship Contributions

Surgical and Medical Practices: M.Y., S.K., Concept: M.Y., S.K., Design: M.Y., S.K., Data Collection or Processing: M.Y., S.K., Analysis or Interpretation: M.Y., S.K., Literature Search: M.Y., S.K., Writing: M.Y.

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