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A comparison of the quality of online information about total knee arthroplasty available in Turkish and English: a cross-sectional study

Fatih KÜÇÜKDURMAZ[1], Serhat MUTLU[2], Harun MUTLU[3], Javad PARVIZI[1]

[1]*The Rothman Institute at Thomas Jefferson University, Department of Orthopaedics and Traumatology, Philadelphia, United States*
[2]*Kanuni Sultan Süleyman Training and Research Hospital, Department of Orthopaedics and Traumatology, İstanbul, Turkey*
[3]*Taksim Training and Research Hospital, Department of Orthopaedics and Traumatology, İstanbul, Turkey*

Objective: The internet has become one of the primary resources for patients to obtain health-related information. While the internet continues to evolve in terms of coverage and technology, concerns regarding the quality of available information have arisen. We aimed to investigate the quality of health-related information on Turkish-language medical websites by comparing it to that of English-language medical websites, in which the subject has long been studied.

Methods: The English term "total knee prosthesis" and its Turkish translation, "*total diz protezi*," were searched in Google. The 1st 30 results were assessed using a validated tool, the LIDA (Minervation, Oxford, UK), which was designed for the scoring of health-related websites according to accessibility, usability, and reliability.

Results: The Turkish- and English-language websites were not significantly different in terms of accessibility, but the usability and reliability of Turkish websites were found to be significantly poorer. We found that the overall quality of information on Turkish websites was poor in comparison with that of English-language websites.

Conclusion: In order to raise consciousness about this problem and improve the quality of health-related information, further studies on Turkish-language websites should be performed. Attempts should also be made in Turkish-language websites to develop website certification systems and/or encourage the dissemination of existing systems.

Keywords: Accessibility; health; internet; knee; LIDA; reliability; usability; quality of information.

The internet has become one of the most widely-used sources of information for patients. According to the Pew Research Center, as of September 2013, 86% of adults in the USA use the internet, 72% of whom search for health-related information.[1] This figure represents 53.1% of the general population in the USA. In Turkey, the rate of internet searches for health-related information rose from 22.4% in 2005 to 59.6% in 2013.[2] These numbers show the growing importance of the internet as a source of reference regarding health information around the world.

While the internet provides a tremendous breadth of

Correspondence: Serhat Mutlu, MD. Kanuni Sultan Süleyman Eğitim ve Araştırma Hastanesi, Ortopedi ve Travmatoloji Kliniği, İstanbul, Turkey.
Tel: +90 212 – 404 15 00 e-mail: serhatmutlu@hotmail.com

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knowledge readily available to patients, controlling the quality of information is impossible, due to the deregulated nature of the internet. The increasing global trend of patients consulting online resources with health-related questions raises concerns about the reliability and accuracy of the information they are obtaining. The technical aspects of web pages, such as spam, accessibility, credibility, readability, and end-user behavior create additional concerns.

Many studies have been conducted to estimate the individual risk of finding inadequate online information related to health problems. These studies have focused on different languages, and all of them concluded that the quality of online information is problematic.[3–10] Increased reliance on the internet as a source of health-related information and the poor quality of much of the information could have a larger negative impact on public health.

In this study, we compared the quality of information on total knee replacement to assess the accuracy of orthopedic-related websites in 2 different languages, Turkish and English, to emphasize the importance of accurate, reliable, and usable information on the internet.

Materials and methods

We searched for the terms "total knee prosthesis" in Google USA (www.google.com) and "total diz protezi" in Google Turkey (www.google.com.tr) in July 2014. Websites were categorized according to the intended audience. Each website was scored using the LIDA tool (Minervation, Oxford, UK). The 1st 30 results were evaluated. Exclusion criteria were video-based websites and social media links. Websites that used multiple tabs or pages to present the information were analyzed on the entirety of the information. Websites were not analyzed based on links to other pages within the site, unless the scoring scale was based on an element of that website. Blog-style websites were analyzed based on the most recent posting.

We used the LIDA tool, an online score-based system that is validated for assessing the accessibility, usability, and reliability of the information on health-related websites. The accessibility section consisted of a website-generated test that had a maximum possible score of 60. The other 2 sections of the LIDA tool used the same 0–3 point scoring system, with a maximum score of 54 for usability and 27 for reliability. Usability was defined as clarity of information and consistency and functionality of the website's design. Reliability assessment was based on the website update frequency, conflict of interest, methodology of content production, and content accuracy.

We compared scores using the Wilcoxon test and adjusted for multiple tests. The Holm-Bonferroni method was employed to reduce Type I errors when multiple paired comparisons were conducted. Statistical significance was defined as $p \leq 0.05$.

Results

The first 30 search results were evaluated. The distribution of scores is provided in Figure 1.

Accessibility: Turkish and English websites received 49 points (81.7%) (range: 45–55 points [75–91.3%]) and 53 points (87.5%) (range: 50–55 [83.3–91.7%]), respectively. There was no statistically significant difference between Turkish and English websites regarding accessibility according to LIDA ($p=0.23$).

Usability: Turkish and English websites received 44 points (80.6%) (range: 29–47 points [53.2–86.6%]) and

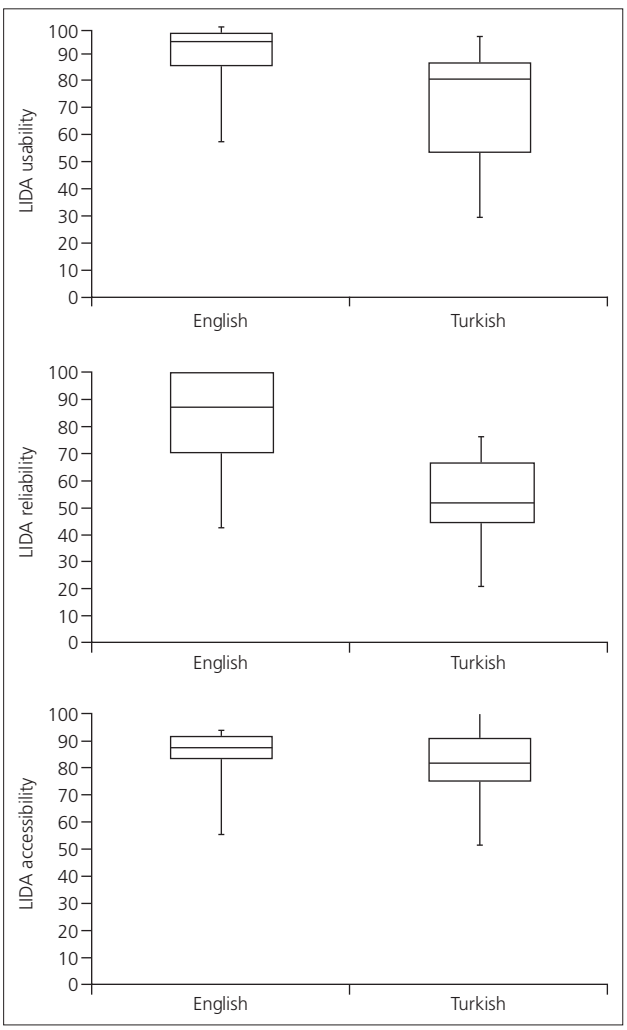

Fig. 1. Scores for Turkish and English websites.

51 points (94.4%) (range: 46–53 points [85.2–97.7%]), respectively. There was a statistically significant difference between Turkish and English websites regarding usability according to LIDA ($p<0.001$).

Reliability: Turkish and English websites received 14 points (51.9%) (range: 12–18 points [44.4–66.7%]) and 23 points (87.0%) (range: 19–27 points [70.4–100%]), respectively. There was a statistically significant difference between Turkish and English websites regarding reliability according to LIDA ($p<0.001$).

Discussion

The internet is a global system of interconnected computer networks, linking several billion devices worldwide. The internet lacks centralized governance in either technological implementation or policies for access and usage.[11] Therefore, the information available online is disorganized and resistant to organizational efforts. However, the internet offers a wide range of benefits to the general public and professionals, as well as to national health systems and, subsequently, public health globally. At the same time, the growth of the internet has also led to new forms of risk. Mismanagement of health information and the illegal promotion and sale of medical products pose a risk to health. Therefore, an international effort to combat these potentially dangerous effects is needed.[12] Some populations may be at greater risk depending on awareness.

Before performing further analysis, we chose to evaluate only the 1st 30 webpages returned from our search. This approach was chosen based on the behavior of internet users, who typically only view the first few pages of their search results.[13] If they do not find what they seek, internet users prefer to perform a new search by entering an alternative search term instead of progressing through a list (Figure 2). Therefore, a highly credible website with a low ranking may be ignored in terms of its positive impact on overall quality.[14] Only Google was used as a search engine to search for web pages; we made this decision based on the market share percentages of search engines in Turkey and the USA (Figure 3).

Research information that is available online in full text has a greater impact than information whose access is restricted.[15] Any registration, login, or subscription steps are dissuasive.[16] Other technical issues may be the operating systems or software and the website's compatibility with commonly-used browsers. Our study demonstrated that the ability to access health-related information was not found to be significantly different between Turkish- and English-language users. This may indicate that the infrastructure of technology or the cost

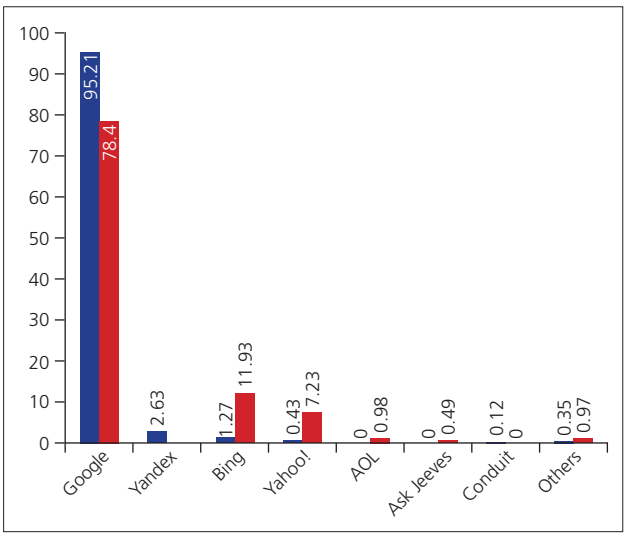

Fig. 2. Number of times participants clicked on a search result by rank order of the link as it appeared in list of search results (Reproduced with permission, Eysenbach G et al., BMJ 324, 573–7, 2002). [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

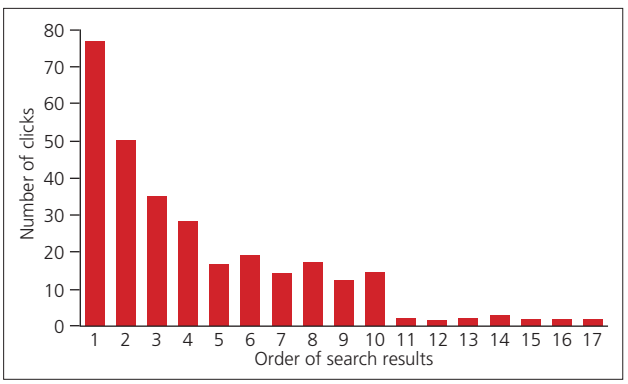

Fig. 3. Market share percentages of search engines in Turkey and USA between July 2013 and July 2014 (Reproduced with permission, StatCounter, Dublin, Ireland). [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

to reach the information is similar between the 2 groups of users.

In contrast to accessibility, the usability of Turkish-language websites was significantly lower than that of English-language websites. Clarity, consistency, functionality, and engageability are important for users to benefit from health-related information. Usability is independent from the available technological level and is related to the design of the website. Low-level usability renders the website ineffective, as it creates difficulty for users to understand the content, regardless of accessibility or reliability.

Accessibility and usability are more important in

Table 1. HONcode principles.

Authority	Give qualifications of authors
Complementarity	Information to support, not replace
Confidentiality	Respect the privacy of site users
Attribution	Cite the sources and dates of medical information
Justifiability	Justification of claims/balanced and objective claims
Transparency	Accessibility, provide valid contact details
Financial disclosure	Provide details of funding
Advertising	Clearly distinguish advertising from editorial content

terms of marketing and more relevant in terms of quality of presentation. However, reliability is a direct indicator of information quality, measuring whether the recommendations and suggestions are realistic or appropriate.

In order to assess the reliability of a website, factors such as updating frequency, conflict of interest, methodology of content production, and accuracy of content must be addressed. The LIDA tool includes scores to determine whether the website can be trusted as a comprehensive, relevant, and up-to-date source of information about all available treatment choices. If a site is not updated regularly, new conflicting evidence may emerge, rendering the site inaccurate. In a study by Yegenoglu et al., the majority of pharmaceutical companies doing business in Turkey failed to provide quality-based criteria on their websites.[17] In addition, in a 7-year follow-up study of same cohort, the authors found progress unsatisfactory for both international and domestic companies doing business in Turkey.[18]

Many websites may have clear or veiled commercial interests. The disclosure of sponsorship is crucial for providing unbiased information; otherwise, users may be misguided. In one study, international and domestic pharmaceutical companies doing business in Turkey were found to have provided inadequate disclosure of conflict of interest on their Turkish-language websites.[19] The results of our study were consistent with this; the Turkish websites were found to be significantly less reliable compared with English-language websites, based on the LIDA scores.

The higher quality of information in English-language websites may partially result from attempts to evaluate the contents of individual web pages. The largest and oldest is the Health on the Net (HON) Foundation, a non-governmental organization that established a code for certification of quality of health information, the HONcode, based on assessment of 8 criteria (Table 1). Furthermore, there are medical search engines, including one from the HON Foundation, that systematically show only certified web pages. Nonetheless, the quality of Turkish websites based on HONcode certification was poor.[19]

Although LIDA is a validated tool in scoring websites based on quality, interobserver and intraobserver reliability is a point of concern. However, we believe that the possible variability in scoring the websites does not change the overall findings.

Different search terms are available in English that can be used interchangeably with "total knee prosthesis." The same might be true for Turkish-language users. Therefore, different queries might be attempted for evaluation.

Awareness surrounding the quality of health-related online information has been a topic of interest in the USA for 2 decades. More than 1,000 papers have been published which assess the quality of English-language health-related online information; however, to the best of our knowledge, there are fewer than 10 studies that have performed a similar assessment of Turkish-language websites.[10,20]

As a result, we want to emphasize the importance of and emerging need for stratification of Turkish-language health-related websites based on their quality. The unsatisfactory information quality of Turkish-language websites should be taken seriously, as poor information could lead to poor decisions regarding health. Low reliability may increase total cost for health expenditures and threaten health conditions of individuals.[21] The user's ability to perform the proper query is a more important factor in obtaining accurate online information, and Turkish users are at a higher risk of obtaining unreliable information about their health.

Conflics of Interest: No conflicts declared.

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