DOES THE INTERNET PROVIDE ENOUGH INFORMATION ABOUT SEPSIS FOR THE GENERAL PUBLIC?

İNTERNET GENEL HALK İÇİN SEPSİS HAKKINDA YETERLİ BİLGİ SAĞLIYOR MU?

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Abstract

Aim: To determine the quality and reliability of the information about sepsis on the internet.

Methods: The quality and reliability of the information on the websites accessed through the most frequently searched words about sepsis were evaluated with the JAMA Benchmark Criteria and the DISCERN scoring system. Data accuracy was compared with the Surviving Sepsis Campaign guidelines.

Results: The search terms used resulted most frequently (36,5%) in information from private hospitals. Only 4 of the 63 websites related to sepsis search terms met all 4 JAMA criteria. The JAMA Benchmark score was found to be median 2±1.18 (min:0- max:4). Of the websites, 74.6% showed an update date. Only 31.7% of the websites examined had expert or author information. The mean DISCERN score was calculated as 36±8.51 (min 16-max 59). According to these results, the quality and reliability of internet-sourced information on sepsis was poor.

Conclusions: The quality and reliability of information about sepsis and related search terms on the Internet were low. It was concluded that public institutions and academic institutions should play a more active role in providing patients with accurate information.

Keywords: Sepsis, internet, information reliability, DISCERN score.

Öz

Amaç: Bu çalışmanın amacı sepsis konusunda internetten elde edilen bilgilerin kalitesi ve güvenilirliği sorgulamaktır.

Yöntemler: Sepsis ile ilgili en sık aranan kelimeler üzerinden, erişilen web sitelerindeki bilgilerin kalitesi ve güvenilirliği JAMA Benchmark Kriterleri ve DISCERN skorlama sistemi ile değerlendirildi. Verilerin doğruluğu Sepsiste Sağkalım Kampanyası kılavuzları ile kıyaslandı.

Bulgular: En sık özel hastaneler arama terimleriyle ilgili olarak sonuçlar ekranına geliyordu (%36,5). Sepsis arama terimiyle ilgili 63 siteden sadece 4'ü 4 JAMA kriterini de karşıladı. Tüm siteler için median JAMA Benchmark skorunun 2±1.18 (min: 0- maks: 4) olduğu bulundu. Güncelleme tarihi mevcut sitelerin oranı %74,6 idi. Çalışmamızda incelediğimiz sitelerin yalnızca %31,7'si uzman veya yazar bilgilerine sahipti. DISCERN skoru ortalama 36±8.51 (min 16-maks 59) olarak hesaplandı. Bu sonuçlara göre sepsis ile ilgili internet kaynaklı bilgilerin kalitesi ve güvenilirliği zayıftı.

Sonuç: İnternette sepsis ve ilgili arama terimleri hakkındaki bilgilerin kalitesi ve güvenilirliği düşüktü. Kamusal ve akademik kurumların hastalara doğru bilgi sağlamada daha aktif bir rol oynaması gerektiği sonucuna varıldı.

Anahtar Kelimeler: Sepsis, internet, bilgi güvenilirliği, DISCERN skoru.

Introduction

Although sepsis results in the death of eight million people worldwide each year, it is a health problem that is not well known by the general public. As a consequence of increased internet access, patients and their relatives now search for more information on the internet in all areas of life, including healthcare. The quality and reliability of information about sepsis obtained from the internet, by whom this information is provided, and its currency are unknown. Incomplete or erroneous information is difficult to replace and can have harmful effects on patients.

The rate of internet users in the adult population in the United States was determined to have reached 85% in 2013[1], and the rate of those who searched for healthcare information at any time was 72%[2]. A study in England reported that individuals in the upper socio-economic group research healthcare more than the rest of the society. In Turkey, it has been estimated that approximately 6 out of every 10 people using the internet in 2020 researched healthcare information at least once [3]. As a result of the widespread use of the Internet, the increasing use of the Internet of Things, and the demands of the healthcare sector in this area, healthcare providers need to adapt rapidly to internet use in order to provide better service. Preventive medicine practices, correct diagnosis, and early treatment can increase the chances of successful treatment, especially for oncological diseases. Conscious internet use can reduce unnecessary hospital admissions in patients, but incorrect or incomplete healthcare information obtained on the Internet may have negative effects such as delays in applying for treatment, incorrect treatment practices, and making it difficult for physicians to communicate or educate patients[4].

The aim of this study was to evaluate the quality and reliability of the information about sepsis on Turkish websites.

Materials and Methods

Local Ethics Committee approval was obtained for this study. (2017-KAEK-16092020).

- *Data Collection*

As Google is the most frequently used search engine with a 80.53% rate in the search engine market in Turkey[5], the data obtained in this study were collected through this site. Data collection took place between 20.09.2020-18.11.2020. Trends is a site that works on Google and examines the frequency of search terms[6], showing the search frequency of the search term in the selected time period and region and the increase of these searches compared to the previous periods with a ratio between 0-100. The most frequently searched or most increased terms are scored with 100 points, and the most frequently used search terms related to this term by people who use the same search term also score between 0-100 points according to their frequency[7]. For the study, the search word "sepsis" was used and the most frequently used terms related to the term "sepsis" were determined through this site. After deleting search history, cookies, and download history on the computer used for the study, the first 30 sites were examined from the displayed web sites by searching for each keyword individually. A total of 300 websites were viewed. The search was made using Turkish language characters and words and sites were excluded from the review if they were not written in Turkish, were copy sites, or had unavailable content.

- *Data Evaluation*

The study inclusion criteria were defined as information on the internet about sepsis, and the most frequently searched terms related to sepsis, as determined using Google trends. Turkish websites, news items, blog sites, scientific articles, academic associations and official

institutions were included in the study and grouped according to these classes. Video content and advertising sites were also included in the study. A search was conducted with the search terms "sepsis", "what is sepsis?", "what does sepsis mean?", "sepsis symptoms", "sepsis disease", "sepsis criteria", and "sepsis treatment". The first 3 pages of results were examined. The study exclusion criteria were defined as information written in a language other than Turkish, or inaccessible content. Duplicate sites obtained from searches of different terms were evaluated only once. Other results were excluded from the study. The content and quality of the information on the websites was evaluated with JAMA Benchmark Criteria and DISCERN score. These review methods have been used and recommended in previous publications as the most appropriate methods to measure the quality of information[8-9]. The JAMA Benchmark Criteria has 4 steps that question the author, citation, adequate description, and citation of content. Sources with an average score of 0 are considered unreliable in terms of information, and those with 4 points as a source of good quality and reliable information. The DISCERN score is derived from 16 items that question whether the content provides acceptable information and explains treatment options. In the DISCERN handbook the website scores are classified as excellent (63-75), good (51-62), fair (39-50), poor (27-38) and very poor (15-26) [9-10]. For this study, the tests were applied by 2 researchers and the average of the two scores was used in the analyses.

The accuracy of the data was compared with the Surviving Sepsis Campaign guidelines. The international Surviving Sepsis Campaign (SSC) is a joint initiative of the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine (ESICM), who are committed to reducing mortality and morbidity from sepsis and septic shock worldwide. The SSC is led by multidisciplinary international experts committed to improving the time to recognition and treatment of sepsis and septic shock, which are leading causes of death worldwide. The SCCM is also committed to improving outcomes for sepsis survivors, especially those with post-sepsis syndrome[11].
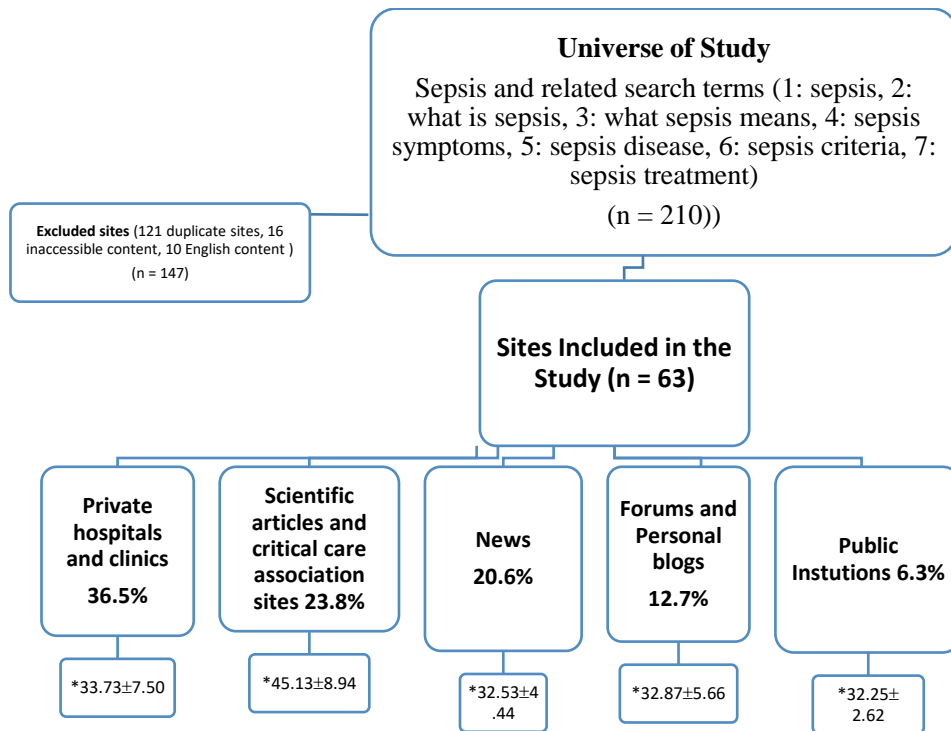
- *Statistical analysis*

Statistical analyzes were done with IBM SPSS 18.0 package program. The conformity of the variables to the normal distribution was examined by histogram graphics and the Kolmogorov-Smirnov test. Mean and standard deviation values were used when presenting descriptive analyzes. One-way analysis of variance (ANOVA) was used for normally distributed parametric variables. Post-hoc analyzes were performed for homogeneously distributed variables. P value < 0.05 was considered statistically significant.

Results

The most frequently searched search terms related to sepsis were found to be *sepsis, what is sepsis?, what does sepsis mean?, sepsis symptoms, sepsis disease, sepsis criteria,* and *sepsis treatment,* respectively. For the 7 key words related to sepsis, a total of 210 websites were found, of which 147 were excluded from the study according to the defined exclusion criteria. (121 similar sites, 16 inaccessible contents, 10 English sites). Thus, 63 websites remained for evaluation. The study scheme is shown in Figure 1. The term sepsis was searched most frequently in March and April in the last 12 months. Distribution of interest in the term sepsis is shown in Figure 2.

A total of 26,300,000 results (within 0.56 seconds) were obtained online for the search term "sepsis". The same word is used in English and Turkish for "sepsis", also popularly known as blood poisoning, and so the primary search feature was set as Turkish pages.

Figure 1: Study scheme and DISCERN scores according to the groups

Universe of Study

Sepsis and related search terms (1: sepsis, 2: what is sepsis, 3: what sepsis means, 4: sepsis symptoms, 5: sepsis disease, 6: sepsis criteria, 7: sepsis treatment)

(n = 210))

Excluded sites (121 duplicate sites, 16 inaccessible content, 10 English content)
(n = 147)

Sites Included in the Study (n = 63)

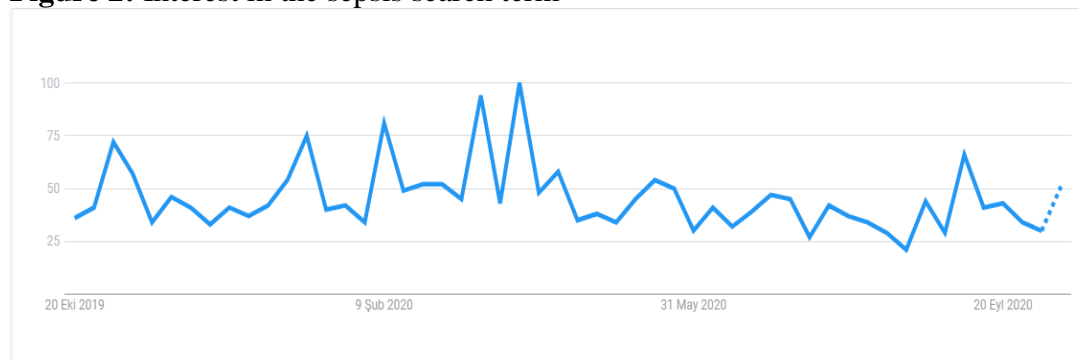| Private hospitals and clinics 36.5%	Scientific articles and critical care association sites 23.8%	News 20.6%	Forums and Personal blogs 12.7%	Public Instutions 6.3%
*33.73±7.50	*45.13±8.94	*32.53±4.44	*32.87±5.66	*32.25±2.62

*: Mean DISCERN scores, ± SD, The frequencies of the result websites are given in percent.

However, 10 results were obtained in English. No other foreign language site was available. When the results were classified according to the content producers, it was observed that information was given most frequently by private hospitals (36.5%), followed by academic publications (23.8%), news sites (20.6%), personal blogs and forum sites (12.7%). State institutions provided the least information with sites at the rate of 6.3%. Table 1 shows the types of websites related to sepsis and associated search terms.

Of the 63 sites related to sepsis search terms, only 4 met all 4 JAMA Criteria.

Figure 2: Interest in the sepsis search term

According to Trends.google.com website; interest in the search term "sepsis" in Turkey in 2020.

Table 1: Types of sepsis related result websites

Groups	JAMA Benchmark Criteria Mean ±Sd	DİSCERN Score Mean ±Sd
Private hospitals and clinics (n=23)	1.17±1.02	33.73±7.50
Scientific articals and critical care assosiation sites (n=15)	3±0.75[a]	45.13±8.94[b]
News (n=13)	1.23±0.72	32.53±4.44
Forums and personal blogs (n=8)	0.87±0.99	32.87±5.66
Public instutions (n=4)	2 ±8.61	32.25± 2.62

Statical analyse; ANOVA test. p<0.05 signaficantly.
a; significantly higher than the other 3 groups except public institutions, p<0.001
b; significantly higher than the other 4 groups, p<0.001

When all the sites were examined together, the JAMA Benchmark score was found to be median 2±1.18 (min:0- max:4). The least met criterion was the "disclosure" part of the author's interest in this article. On 74.6% of the sites, an update date was shown. Expert or author information was included in 31.7% (20/63) of the sites examined. The JAMA criteria scores of the groups are shown in Table 1.

The mean DISCERN score was calculated as 36±8.51 (min 16-max 59). According to these results, the quality and reliability of the internet-sourced information was poor. The desired quality level of good (51-62) was observed for 7 sites, all of which were for academic purposes. The scores of the other sites were evaluated as moderate fair (39-50) for 11, poor (27-38) for 41 and very poor (15-26) for 4. The types of websites were seen to be for academic purposes in 23.8%, 6.3% were public institutions, 36.5% private hospitals and clinics, 20.6% were news sites, and 12.7% were personal blogs and forums. DISCERN score of the "Scientific articles and critical care association sites" group was significantly higher than the other 4 groups (p=0.018, p<0.001, p<0.001, p=0.002, respectively). When Jama scores were compared, the score of this group was significantly higher than the other groups except "public institutions" (p<0.001).

The accuracy of the contents was compared with the Surviving Sepsis Campaign guidelines. The rate of sites containing at least one item of erroneous information was calculated as 19% (12 sites). The rate of false information was found to be high (50%), especially on forum sites (p=0.036).

Discussion

This is the first study to question the accuracy of internet-based information on sepsis written in Turkish and other languages. According to the DISCERN score and JAMA Benchmark Criteria used in the evaluation of health information from the internet, the quality and reliability of the information about sepsis in Turkish sites were found to be low. The rate of internet usage in Turkey has risen from 30.1% in 2007 to 79.0% of adults (16-74 years) in 2020. Information on every subject can be quickly accessed on the internet [12], and this information society has led to the desire to consult more than one physician and to obtain more information on important health problems. Topics related to health that are researched on the internet constitute 4.5% of all the daily searches[13]. It has also been reported that 13.6% of physicians have stated that they want to discuss information obtained from the internet every day, and 36.4% of their patients at least once a week[12].

Sepsis is an overreaction of the body to an infection, which is a vital medical emergency. Every year, 30 million patients worldwide are diagnosed with sepsis and 8 million people die due to sepsis. Since 2007, the World Health Organization has accepted sepsis as a global problem[14], and patients and their relatives aim to obtain information about this important issue on the internet. However, according to the results of the current study, most of the information on the internet is not evidence-based, and many websites do not contain expert opinion. An important proportion is the information whose timeliness and source is unknown. Only 31.7% of the sites examined in this study had expert or author information. In a study which examined the term "meniscus rupture" on the Internet, the search results on this term on Turkish sites were determined to be inadequate, similar to the current study[15]. However, the scoring system used in that study was evaluated with a scoring between 1 and 20, with a modified version of the scoring system used by Gren et al. and was more subjective[16]. The DISCERN and JAMA benchmark scores used in the current study are generally accepted and used in current studies[8]. In the previously mentioned study, the results were obtained from 3 frequently used search engines. However, although other search engines such as MSN and Yahoo had a greater market share in 2013 when that study was conducted, Google search engine is by far the most frequently used today[5].

Of the current study results, 13 (20.6%) were news websites and 8 (12.6%) were blog sites, and the content of these sites was observed to be of the lowest quality and reliability. In particular, the rate of providing author information on news sites was the lowest. According to a meta-analysis by Eysenbach which examined 24 studies, 2.3 million cancer patients obtained information from the internet, and it was reported that 31% found that these sites affected their decisions, 27% found them confusing, and 76% contradictory[17]. Especially in critical situations such as cancer, incorrect information or incomplete information may cause patients to lose the chance of early treatment.

Septic patients are mostly followed up in intensive care units. Although it is often difficult for these patients to be examined in more than one center or to choose a physician, 36.5% of the sites included in the current study were produced by private hospitals and clinics and according to the DISCERN scoring of these sites, sufficient data were not provided in respect of the risks of treatment and alternatives, and the success of correct and early treatment could be explained in more detail. This issue is an

ethical problem that may affect patients' hospital choices. Nevertheless, in a study by Wanless, 63% of the patients stated that the information they obtained from the internet prevented them from visiting a doctor unnecessarily. In this respect, it may reduce health expenditure[18]. It is noteworthy that public institutions, which can play a more neutral role in informing the public, have a low screening percentage of 6.3%. In a study by Barlow et al., it was determined that although adult patients mostly need information about new areas of research (57%) and joint injuries (48%), young people seek advice from their peers and on sensitive issues such as sexual health, lifestyle, and drugs[19]. Moreover, it is clear that there is a need for Turkish versions of the sites seen in English that have been shown to be based on scientific resources and are simple enough for the public to understand the medical conditions. Public institutions can play an important role in providing accurate and impartial information.

As a result of using the term sepsis with the same expression in academic articles, 23.8% of scientific articles and critical care association sites were followed on the sites. Although these results generally meet the JAMA benchmark criteria (3±0.75) and DISCERN scores (45.13±8.94) are high, it is debatable whether they could be understood by the patient or their relatives. In a study measuring the quality of internet information about SARS-COVID-19, it was observed that the JAMA and DISCERN scores of academic sites were higher, but advertising sites were displayed more frequently [8]. In a previous study of internet data quality on the most common diseases in Turkey, it was found that 92% of the sites included in the study had no evidence-based information[20]. However, it was noteworthy that 40.6% of the existing sites that provide information about health do not refer to a physician or health worker, and 65.9% of the sites contain advertisements. Only 9.7% of the researchers stated that they would recommend the web pages to their patients.

In the current study group, guidelines have stated that late treatment for disases such as sepsis causes increased mortality and morbidity in patients[11].

A point that can be considered as a limitation for this study was that sites in English were not included. Some patients and their relatives may be able to access information through these sites[21]. However, if English sites had been included in the study, most results on sepsis, which is the same search term in Turkish and English, would have been in English and the implementation of the results would have been difficult in respect of Turkish society in general, the majority of which mostly read Turkish content.

Conclusions

It was observed that the quality and reliability of information about sepsis and related search terms on the Internet was low. It was concluded that public and academic institutions should play a more active role in providing patients with accurate information.

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