

Be Careful What You Search For: an analysis of the quality of Internet healthcare information

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Abstract

Objective: to provide family practice doctors with data on the quality and of patient information for hypertension on the internet and offer health professionals resources to direct patients towards higher quality information.

Hypothesis: the initial ten resources regarding hypertension that are found with Google are poor. Patients can find more reliable information using the initial ten resources found using the Health on the Net search engine.

Methods: the search term “high blood pressure” was searched for using Google and Health on the Net. The top 10 results returned were analyzed using the DISCERN tool to determine reliability and credibility.

Results: the sample size was not large enough to detect a significant difference between resources found on both Google and Health on the Net.

Conclusions: no statistical conclusions can be drawn but the criteria for inclusion on the Health on the Net search results contain criteria that are known to increase reliability in websites. The DISCERN tool may require more training to use effectively but could be used to guide clinician or patient evaluations of health material.

Introduction

The increasing availability of unfettered health information on the Internet can cause misinformation in patients and complicate the treatment and understanding of important medical conditions. As the Internet becomes more pervasive and influential, it is important to remain familiar with what is being presented to our patients when they are curious about a condition or medication. Understanding the essentials of how a search engine tailors results, the general quality of Internet health information, the tools available to evaluate resources, as well as specific trusted websites can help to better close the gap between what is discussed during an encounter and what is found elsewhere.

Research on the quality of websites has been done on a variety of topics that include, but are not limited to, such terms as acute otitis media (Goslin et al, 2013), myringotomy tubes (McKearney et al, 2013), colorectal cancer (Grewal et al, 2013), obstructive sleep apnea (Languille et al, 2013), coronary angioplasty (Kirthi et al, 2012), inflammatory bowel disease (Languille et al, 2010), and the Mediterranean Diet (Hirasawa et al, 2012). All of the above studies included Google in their search results and many included Bing, MSN, or Yahoo. The conclusions of these studies demonstrate variable

quality in Internet information with many having poor quality of information. This quality was determined by a variety of evaluation tools. Additional variables such as commercial bias, variances in quality among government versus non-government sources, and correlation with rating institutions such as "Health on the Net" were also performed. These correlations and comparisons also varied significantly and the most recurrent conclusion was that the physician bears the responsibility of guiding the patient through the unreliable sources of health information that are predominant online.

A vital component when investigating what information the patient is exposed to involves understanding the experience of the patient when he or she searches the Internet. Search engines continue producing more elegant ways to individualize the search results that are returned. As a result, this introduces a variable in the consistency of health information available on the Internet and a significant barrier to understanding the patient's experience. The use of "cookies," which are downloaded bits of information stored by a website on the users computer and later returned to website on subsequent visits, allows for individualized content to be presented to the user when returning to the site. As a result, one patient may get a set of results influenced by recent searches of their comorbid conditions while another may get results influenced by recent dietary searches. This type of inconsistency, inherent to the process of using a search engine, highlights the necessity of physicians taking the responsibility to modify office education to include skills and resources for continued patient-initiated research.

The DISCERN tool is one way for healthcare providers to analyze the quality of websites themselves. This instrument was originally developed as a way to evaluate patient information and was expanded on in 2008 (Matsoukas et al) to more fully incorporate online information. It is designed to establish quality thresholds for health information in an effort to combat misunderstanding from poor or biased evidence presented online. It does not evaluate scientific quality or accuracy but rather the transparency and thoroughness of websites. It's usefulness and ease of understanding is supported by its widespread use in the literature.

The applicability of the DISCERN tool is also enhanced by the lack of training required to use it. Designed for patients and physicians alike, the free and downloadable packet contains all information needed to use the tool. In a study of the initial assessment of health information, Charnock et al (1999) noted that it can be used by patients but that training will improve the quality of it's use. Also, significant correlation between patients and physicians ratings with regard to use of the DISCERN tool has been demonstrated (Griffiths et al, 2005), albeit prior to the 2008 update. A Japanese study (Batchelor et al, 2009) showed a higher inter-rater agreement between health professionals versus

patients, indicating that a higher degree of variability existed between patient interpretations in that study. This brings some uncertainty into how varied patient experiences can be, even when using the tool. A Swiss study (Khazaal et al, 2009) used a “Brief DISCERN,” which was drawn from the original tool and tested for correlation. It did show a similar ability to the DISCERN tool to determine good vs poor sources of information; maintaining reliability and validity. It has not been as thoroughly tested however, so it may not yet be reliable enough to distribute to interested patients. Overall, the decision to give the DISCERN tool to patients is feasible and supported to a degree by the literature. It will be the practitioner’s prerogative to determine whether the patient needs the ability to evaluate websites or if they will be better served by simply being directed to quality sites.

For an easier and more intuitive approach to looking for reliable information, the search engine ‘Health on the Net’ offers a database of websites that have met specific requirements for content and sources of information. The Health on the Net Foundation (HON) is a not for profit, non-governmental organization that aims to direct healthcare users and providers towards sound and reliable online health information. Founded in 1995, HON operates out of Geneva Switzerland and is funded by numerous sources including, but not limited to, the State of Geneva, the French National Health Authority, and the Geneva Hospital.

In response to the massive volume of healthcare information available on the Internet, HON developed a code of conduct (HONcode) to hold healthcare websites accountable for the reliability and usefulness of the information that they provide. Some of the main points of the code are: advice given only by medical professionals with credentials of authors, references to source of information and when it was last updated, transparency of authorship, sources of funding for the site are listed, all information must be supported by balanced, well-referenced scientific information.

HONCode is not designed to rate the veracity of the information provided by a Web site. Rather, the code only states that the site holds to the standards, so that readers can know the source and purpose of the medical information presented. The HONcode is voluntary, which means that webmasters and information providers can apply for HONcode certification. Following this, the website is reviewed by a specialized team of health and legal professionals. The HONcode certification is a dynamic state and is extended every year according to site compliance. (Health on the Net Foundation, 2013)

Method

The DISCERN tool was applied to the first 10 searches for “high blood pressure” on Google as well as on Health on the Net. The search results were gathered on 10/3/2013 using Google Chrome on a home computer with cookies disabled and using a newly created computer user name. No exclusion criteria were used and advertisements on the sidebar and perimeter were not evaluated. Both principal investigators individually evaluated the websites over the following 2 weeks. The website addresses and the search engine used to generate those websites were known to the investigators.

Results

In order to compare the total scores for three sections of the DISCERN tool between Google and HON, the Wilcoxon rank sum test was used since the normality of scores does not hold and the sample size is small. At a level of significance of 0.05, we do not have enough evidence to conclude there is a statistically significant difference between Google and HON in the three sections’ total scores.

Inter-rater reliability was evaluated by calculating the concordance correlation coefficient for each of the three sections of the DISCERN. The strength of agreement was poor between the two raters for all three sections.

Sample size estimation was based on comparison of two independent samples using t test. The current study indicates that there is a mean difference of 1.7 between total section 1 scores for Google and HON. The standard deviation in Google group is 6.39, and the standard deviation in HON group is 3.24. The pooled standard deviation is 5.07. With the two-sided significance level of 0.05, 282 websites (141 in each group, allocation ratio 1:1) would allow us to test the effect size (0.34) with 80% power. We need 376 websites (188 in each group, allocation ratio 1:1) to ensure 90% power. Analysis was done using SAS version 9.4.

Discussion

The results show that there are significant limitations to our study in terms of inter-rater reliability and the amount of websites needed to achieve required power. As a result, no significant difference was noted between Google and Health on the Net.

The degree of inter-rater reliability could be better evaluated by having more evaluators that would contribute more data points to the calculation. In addition, providing training beyond the instructions included in the DISCERN packet could start to close the gap between the raters scores. This could include having a knowledgeable outside party demonstrate going through a website using DISCERN. Also, the main evaluators could

review the same website simultaneously as practice and discuss the choices made, although that is not as the tool is intended.

The 282 websites that would be required to achieve 80% power is impractical. Our study is designed to select the initial 10 sites from the search engine because those are the most immediate and likely to be visited. The studies done previously on Internet information only ascertained the quality of the information and not the comparison of one search engine to another. Future research would still likely need to be limited to the first 20 results and require other ways of increasing power, if possible.

Conclusion

Although the statistics from our study are not significant regarding HON vs Google, there is an accepted need for higher quality information regarding patient conditions. This is based on studies showing poor information generally available through the most common forms of Internet research. A knowledge of the unpredictable nature of internet searches, of the convenience of Health on the Net (www.healthonnet.org) to search through more evaluated websites, and the skills that can be learned through understanding the DISCERN tool will allow the medical professional to better serve the needs of the patient population.

Resources

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