

Title

Focusing on Health Information: How to Assess Information Quality on the Internet

Introduction

In March 2002, the *British Medical Journal (BMJ)* published a collection of articles around the theme of quality assessment of health information on the Internet. The number and variety of the *BMJ* articles reflect the amount of work being carried out in the field of health information generally, and more specifically in health information on the Internet. Contributors to the issue were affiliated with organisations as diverse as the European Commission to NHS hospitals in the United Kingdom, with job descriptions ranging from researcher to medical student. With the exception of two authors working in the area of eHealth (potentially a link to librarianship or information management) there was no representation from our field.

That is not to say that the literature of librarianship and information science has not published articles about the quality of information on the Internet. Journals in our field, such as *Health Information and Libraries Journal* and the *Journal of the American Society for Information Science and Technology (JASIS&T)* carried articles in 2002 that discussed the topic. However, these publications are not directed at the wider library and information science audience. *Health Information and Libraries Journal* is aimed at a specialist audience involved in health libraries and *JASIS&T* is very much a research-oriented publication.

Two issues emerge from these observations. Firstly, it would be useful if library practitioners from all types of libraries were aware of the work in the area of quality of information on the Internet. While, the information needs of library users vary greatly, particularly those of public library users, it would be fair to assume that some of these users need health information and will use the Internet to find it. Awareness of the work being done in the area of assessing the quality of information on the Internet is important to ensure the services librarians are responsible for are useful and add value for their users. This awareness is unlikely to occur if the discussion about information quality on the Internet is being published in journals that few library practitioners read (Ali, 1985; Haddow, 2001; Klobas, 1991). Secondly, by bringing this work to the attention of library practitioners and information managers it is hoped that they will take an active role in the discussion about information quality on the Internet, as their unique perspective as organisers and facilitators of access to information will broaden the debate.

This paper was written to outline the primary issues that are driving the quality discussion, to identify some of the useful tools already developed to assess quality and to illustrate, using an example of a small study, why it is important that librarians are aware of these issues.

What is quality?

Any measure of information quality is attended by a myriad of individual characteristics and contexts that affect perceptions of what quality means. In traditional publishing channels, the term quality has rarely been used to describe information. To some extent, this is due to the publication process itself, which works as a filter to ensure quality (Eysenbach, 1998). For example, librarians and

information managers rely upon reputable publishers, booksellers, subscription agents and reviewers who form a natural framework for providing (in most cases) credible advice to achieve collections of quality.

Information on the Internet challenges these traditional measures of quality. As any Internet user knows, the web pages retrieved from a search engine search can vary from highly scholarly to totally irrelevant information. But, in this mass of information there will be information relevant to a specific need, written or created by respected authors and organisations with credibility in their field. The ever-increasing amount of work on developing tools to assess the quality of information aims to assist people to identify this information. For some areas, such as information seeking and retrieval research, the quality of information on the Internet is being studied in a similar context as relevance was in the past. In health science, where information quality can mean the difference between an effective treatment of a health problem and a potentially dangerous and/or harmful outcome, criteria for information quality have been developed to act as a gold standard to which all health sites are encouraged to ascribe.

Quality of information on the Internet: A library and information science perspective

When online information was only available as discrete databases of records, usually in a defined subject area, information retrieval researchers sought to identify the meaning of relevance to users and how systems could best meet users' relevance judgments. In this context, relevance was a form of quality. Relevance is associated with recall and precision, and calculations of all these concepts involve knowledge about the approximate number of items in a database being searched and the number of relevant items in that database in relation to a specific search (Mizzaro, 1997). Clearly, calculations of this nature are not available when searching the Internet. Furthermore, while relevance judgments of traditional online information have always been subject to variation according to individual needs, even greater variation will be seen in relevance judgments of information found for the diverse range of information needs for which the Internet is used. That is, online information has moved away from being primarily the province of the academy.

Quality is a concept considered in the work of Thomas Allen in the 1960s when he explored the information behaviour of research scientists and engineers (Klobas, 1995, p.96). Klobas identified four components of quality from these and other studies. They are: information quality; technical quality; relevance; and participants' interpretation of quality. The first of these components, information quality, is the nearest equivalent to the way in which quality is viewed in terms of health information. It includes the attributes: accuracy; currency; authority; and novelty. The second component, technical quality, is included as a criterion for some health information quality assessment tools and relates to factors such as ease of navigating a web site and graphics use.

Quality was also a component of a number of studies conducted in the 1990s that explored users' relevance judgements (Park, 1993; Wang & Soergel, 1998; Wang & Soergel, 1999). However, it is a recent study by Rieh (2002) that brings much of this work together to focus on two factors: information quality and cognitive authority (a term first used by Wilson in 1983 to describe the judgments humans make regarding

the credibility and believability of a source of information). Rieh found there were five facets of information quality: goodness; accuracy; currency; usefulness; and importance. Rieh's facets of cognitive authority are: trustworthiness; credibility; reliability; scholarliness; how official it is; and authority. These facets are similar to many of the criteria included in quality assessment tools for health information on the Internet.

As noted above, many of the papers published in our field about quality of health information on the Internet tend to be research oriented, however, there is a notable exception that indicates how librarianship can contribute to the broader discussion. The *DISCERN Handbook*, published with funding from the British Library, was designed to be used with printed health information rather than information on the Internet. The purpose of the Handbook is to assist users of health information to judge 'the quality of written consumer health information on treatment choices' (Charnock, 1997). But many of *DISCERN*'s quality criteria are relevant to both printed and electronic formats and the Handbook is widely cited in health science literature.

Quality of information on the Internet: A health science perspective

Like our field, much of the literature about the quality of information in health science publications has a research focus. However, increasingly quality is an issue that is being brought to the attention of all health professionals and health consumers. (See, for example, the *BMJ* issue referred to above and a November 2002 issue of the *Weekend Australian* newspaper which published a half-page article in the Health section about online health information (Gaffney, 2002)). There is nothing new in the suggestion that some health information available in the public sphere is not accurate, is produced by people who do not have the expertise to do so, and is potentially dangerous for users of the information. Previously, though, health information was not available in the vast quantities and with the easy access that exists now with the Internet. A number of studies have been carried out to assess the information located on the Internet about specific health topics and all arrive at similar conclusions, epitomised by the following statement: 'there is an urgent need to check public oriented healthcare information on the Internet for accuracy, completeness, and consistency' (Impicciatore, Pandolfini, Casella, & Bonati, 1997). Accuracy is particularly difficult for health information consumers to assess because they usually have no benchmark with which to measure it.

In addition to concerns about accuracy, completeness, and consistency of health information on the Internet, other issues are raised, such as currency of information and lack of accountability (Bower, 1996; Eysenbach et al., 1998; Silberg, Lundberg, & Musacchio, 1997; Van Der Weyden, 1997; Wyatt, 1997). In relation to accountability, Bower (1996) noted that product advertisements on the Internet can and do carry information that is in many cases based on unsubstantiated claims about treatments and cures. Moreover, the products being advertised and available through online purchase are not bound by the regulations that would apply to over-the-counter products in the purchaser's country. Silberg, Lindberg and Musacchio (1997) wrote, 'at first glance, science and snake oil may not always look all that different on the Net'. These authors suggested that technology has the potential to dazzle users so that they fail to apply critical faculties they employ in other information environments. A further aspect of accountability, not isolated to information on the Internet, is an

apparent reluctance of authors of health science information to declare conflict of interest, such as drug company support for their work (Tonks, 2002).

Eysenbach (1998) noted that the context in which health information appears on the Internet is also important because context provides users with clues to the purpose, intended audience, and credibility of the information. Using the term 'context deficit', Eysenbach listed a number of ways that Internet users could be misled by information found on web pages. One example is the lack of traditional publishing 'markers' that printed forms of information usually carry. These can indicate to readers that the information was created for a particular audience and alert them to the level of subject-specific knowledge required to fully comprehend the information. Another example of 'context deficit', noted by Eysenbach, occurs when a search engines takes a user directly to a web page without first accessing introductory information, such as a title page which may carry 'disclaimers and warnings'.

Tools to assess the quality of health information

A variety of assessment tools for judging the quality of health information on the Internet have been developed that set out criteria that take account of the concerns discussed above. These tools range from simple checklists of criteria to sophisticated software programs that filter information found in an Internet search (BIOME Special Advisory Group on Evaluation, 2001; Charnock, 1997; Eysenbach et al., 1998; Health On the Net Foundation, 2000; Health Summit Working Group, 1997; Pealer & Dorman, 1997). Wilson (2002) provides an excellent discussion about the different types of quality assessment tools that have been developed and a number of these tools are listed at the end of this article.

The assessment tool of the Health Summit Working Group falls into Wilson's 'codes of conduct' category. Codes of conduct recommend standards that creators of websites can use as a guide in their development phase and that consumers can use to assess the quality of the information on a website (Wilson, 2002). For example, when credibility of a website is being assessed, the user is encouraged to examine the source, context, currency, relevance and/or utility, and editorial review process of the information. This assessment tool was used in a small study examining the quality of information on the Internet about caring for a child with fever. A short overview of this study is illustrative of many other studies that have explored the quality of health information on the Internet.

An example of health information quality on the Internet

A total of 22 web sites, found using popular search engines (Google, AltaVista, and Yahoo!) and simple terms (child and fever), were assessed and each site was evaluated against the criteria: accuracy; currency; source; original source; and disclosure. Accuracy was determined by the extent of agreement with the findings of a systematic review conducted in 2001 that gathered evidence about the most effective treatment for a child with fever (Watts, Robertson, & Thomas, 2001). In terms of health information, systematic reviews are regarded as providing the best possible evidence about a topic. A further criterion, completeness, was examined to determine whether websites carried warnings against potentially dangerous treatments.

At best, 14 websites (64%) carried accurate information about how to care for a feverish child. At worst, only one website noted that sustained use of paracetamol is not advised – an important issue that has gained public exposure through the mass media in recent months (see for example *The West Australian*, Saturday August 10, 2002 and ABC television's *7.30 Report* on November 5, 2002). The majority of websites were current, but 9 (40%) had no creation date. Source information was included in nearly all the websites, however, only half the websites carried disclosure information, which related to the purpose and intended use of the information. Warnings about potentially dangerous treatments for a child with fever were not given by between 7 to 10 (32% - 45%) of the websites. Overall, only 3 (14%) of the 22 websites could be classed as carrying quality information based on whether a website met all criteria included in the study. These findings are supported by numerous other studies (Abbott, 2000; Bidwell, 2000; Eysenbach & Kohler, 2002; Impicciatore et al., 1997; Kunst, Groot, Latthe, Latthe, & Khan, 2002; Pandolfini & Bonati, 2002).

Implications for library practitioners and information managers

The issues discussed above illustrate the challenges facing librarians and information service managers in their provision of health information to their users. Clearly, it is not enough to offer general directions to information on the Internet as this information can vary widely, unlike printed resources on the shelves that have been selected within a framework of quality judgments. These issues are particularly important for public libraries which may be the primary source of information for some users.

There are a number of strategies that might be considered by librarians to ensure their users gain access to health information of quality.

- Reputable consumer health sites can be listed on a library's web page, providing direction for users with little prior experience.
- A short guide to criteria with which to assess the quality of information could be compiled and either given to users or left near computer terminals with Internet access.
- Short information sessions about quality could be incorporated into general Internet training sessions or included when users ask for advice when searching the Internet.

The first list below is a collection of health information sites created by reputable organisations specifically for health consumers. A recent initiative by the Federal Government has provided all Australian Internet users with free access to the Cochrane Collaboration Library, an important international source of high quality health information. Although much of the information in the Cochrane Library website is not written for consumers, the summaries available on the Cochrane website and included in the Medibank Private website are written for the health consumer audience. It should be noted that health information on the Internet should not be regarded as a substitute for consulting a health professional.

Reputable websites for health consumers

- ABC Health Matters: Australian Broadcasting Corporation <http://www.abc.net.au/health/>
- Agency for Healthcare Research and Quality <http://www.ahrp.gov/consumer/>

- Better Health Channel: Government of Victoria, Australia
<http://www.betterhealth.vic.gov.au/bhcv2/bhcsite.nsf?Open>
- Choice: Australian Consumers' Association
<http://www.choice.com.au/articles/a100481p1.htm>
- Cochrane Consumer Network <http://www.cochraneconsumer.com>
- healthfinder: U.S. Department of Health and Human Services
<http://www.healthfinder.gov>
- HealthInsite: Australian Commonwealth Department of Health and Aging
<http://www.healthinsite.gov.au>
- Health Topics A-Z: World Health Organisation - information in English, Spanish and French <http://www.who.int/home-page/>
- Medibank Private - includes Cochrane Consumer Network information
<http://www.medibank.com.au/index.asp>
- NHS Direct: National Health Service in the United Kingdom
<http://www.nhsdirect.nhs.uk/>

Below is a list of websites for a range of quality assessment tools developed to evaluate health information on the Internet. While the tools have, in most cases, been developed for health information, many of the criteria included to assess the quality of information are relevant to all types of information on the Internet.

Quality tools for assessing information on the Internet

- American Medical Association: Guidelines for American Medical Association web sites <http://www.ama-assn.org/ama/pub/category/1905.html>
- Discern: Quality Criteria for Consumer Health Information - a questionnaire to judge the quality of health information <http://www.discern.org.uk/>
- eEurope: Good Practice Guidelines - developed as part of the EU Information Society program
http://europa.eu.int/information_society/europe/ehealth/quality/index_en.htm
- Health on the Net (HON): Code of Conduct - ethical standards and logo for web site developers <http://www.hon.ch/>
- Health Summit Working Party: Assessing the Quality of Internet Health Information - a list of criteria for assessment of Internet information
<http://hitiweb.mitstek.org/hswg/default.asp>
- HiEthics: Health Internet Ethics - ethical principles for web site developers
<http://www.hiethics.com/Principles/index.asp>
- Internet Healthcare Coalition: eHealth Code of Ethics - a code of ethics for health care sites on the Internet
<http://www.ihealthcoalition.org/ethics/ehcode.html>
- MedCertain: An International Trustmark for Health Information – a self- and third party rating system for identification of trust-worthy health information
<http://www.medcertain.org/>
- Net Scoring: Criteria to Assess the Quality of Health Internet Information – quality based on points awarded – to maximum 312 points <http://www.chu-rouen.fr/netscoring/netscoringeng.html>
- Quick: The Quality Information Checklist - designed for children and young adults <http://quick.org.uk/>
- URAC: Health Web Site Accreditation - the logo indicates a web site has been reviewed for quality <http://www.urac.org/>

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