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QUALITY OF INTERNET HEALTH INFORMATION, PART II: A SURVEY ON HEPATITIS B

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ABSTRACT

This study aims to determine the relationship between web quality content and the results shown by quality evaluation tools as Silberg score for validity of health information obtained from the Internet about hepatitis B. Keywords relevant to viral infectious diseases were searched across 10 search engines. Search engine results from Google and AskJeeves were selected to be studied. The quality of relevant information to hepatitis B was evaluated using Silberg criteria and the concordance of hepatitis B information provided by the infectious website with the relevant WHO Fact Sheets was determined (WHO completeness and accuracy). From a total of 63 infectious websites, 20 were identified as relevant to hepatitis B. For all websites the Silberg score was determined. Then, a correlation was assessed between both WHO completeness and accuracy with Silberg score and also for each of the features in the websites. No significant was found except between Website Quality Approval and Silberg score. One of the main problems of the Internet evaluation is the lack of a tool to predict the quality rate of content.

Key Words: *Hepatitis B, Quality of Health Information, Website Quality Approval, Silberg criteria, WHO, e-Health*

INTRODUCTION

Hepatitis B virus (HBV), a serious public health problem worldwide and the major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma, was estimated that is responsible for mortality of 500, 000 to 1.2 million people annually. Therefore, the global disease burden of HB is substantial. Health-care providers and people with hepatitis are faced with many management decisions and huge health information and valid information is essential in a chronic disease with many treatment options (Hou, Liu, and Gu, 2005).

More than one-third of internet users are health information consumers (World Internet usage statistics and population statistics, 2004; Brown, 2004). The Internet has a significant influence on health management and patient outcomes (Forkner-Dunn, 2003). The greatest barrier to the Internet in informing health care is finding accurate, valid, reliable and complete information (Griffiths and Christensen, 2000; Pandolfini, Impicciatore, and Botani, 2000). Many websites are competing to advertise for cure-all remedies and market share, which can often lead to biased information and medical quackery on the web (Kiley, 1999).

Major self-regulatory initiatives have developed quality evaluation tools for health information quality. These scale should be able to present a potential indicator of website quality from a number of attributes of a publication that guide general users to accurate and complete health information. Users should be aware about rating tools with a responsibility to recognize valid and reliable information (Risk and Dzenowagis, 2001; Griffiths and Christensen, 2002).

In the present work, we intend to find if those websites that obtained the highest rate according to Silberg criteria, can show a high accuracy and completeness score based on the concordance with WHO Fact Sheets or not.

MATERIALS AND METHODS

Identification of websites

A key-word search (viral infectious diseases) of the Internet was performed during second half of 2003 by a survey among 10 top search engines according to website "searchenginewatch" (Griffiths and Christensen, 2002; Sullivan, 2000). The first 100 websites returned by each search engine were

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examined and finally the results (N=63) cumulatively obtained from Google and AskJeeves were determined to be those websites that users usually encounter in their navigation. Only twenty websites included some information about Hepatitis B.

English, active, and free websites were included to the study providing some information about at least 5 viral infectious diseases. Other websites and also websites with the following features were excluded: if (i) they were presented in a language other than English, (ii) were a library, gateway or directory, and (iii) provided information about viral infectious diseases in animals. All retrieved websites were saved on CD for later analysis.

Assessment of website quality

The information quality of 63 websites was assessed by the author using the Silberg criteria including Authorship, Attribution, Disclosure, Currency (Silberg, Lundberg, and Musacchio, 1997) based on a nine-point Likert scale ranging from 1 (the publication quality is poor) to 9 (the publication has of 'good' quality and is a useful and appropriate source of information). Websites were also assessed for general characteristics. Also, the completeness and accuracy of 20 Hepatitis B websites was assessed via the concordance of content provided by the infectious website with the relevant WHO Fact Sheets (WHO, 2002 and 2003).

Analysis and data interpretation

Descriptive statistics (percentages) were used to summarize data. The association between WHO accuracy and Silberg score was assessed by Spearman test ($P < 0.05$) in Hepatitis B websites but the correlation between WHO completeness and Silberg was analyzed by Pearson test ($P < 0.05$) in them. Also, Chi square and Eta tests were used to find a probable relationship between Silberg score and each of the characteristics of infectious websites.

RESULTS

According to Table 1, ownership in infectious diseases websites tends to be organizational (95.23%). Less than half of the studied websites offered infectious information in both general and specialized levels. Only 23.8% of these websites were solely specialized. More than 95% of our sample had a type of feedback system. Users of the studied websites were common among websites mainly as follows: general users as 69.84%, healthcare professionals as 46.03%, and patients in lowest level as 25.39%. Also, in assessing aims of infectious websites, main figures were found: information services (68.25%), Education (63.49%), and health service with lowest level as 4.76%. Most websites had an origin from English speaking countries (92.06%). Less than 25% of websites could obtain a quality approval from a Quality Evaluation Institute. Health subject index was observed in 65.07% of the studied website. Other health links were observed in the second level (61.9%).

Table 2 shows that r value for WHO accuracy and Silberg score is 0.196 indicating a probable association between Silberg score and WHO accuracy but it was not significant ($P = 0.407$). The reason is mainly low Hepatitis B websites ($n = 20$) that existed among searched infectious diseases websites. If the study can be repeated via a direct navigation with key word "Hepatitis B" to obtain a larger sample size, the potential of the obtained r value can be challenged for the ability of Silberg score to predict significantly the accuracy of website contents.

Also, there was a strong r between WHO completeness score and Silberg score ($r = 0.202$) but is not significant ($P = 0.393$). The r value shows that a probable predictive potential exists for Silberg score regarding completeness but because of short sample size mentioned above it could not be assessed. A direct association was found between Website Quality Approval in Hepatitis B websites and Silberg score. Therefore, users can rely on them to find reliable health information about hepatitis B. An association could not be assessed between other features of hepatitis B websites and Silberg score because of no possibility for performing Eta test (more than 25% of cells showed a value < 5) as well as the mentioned above reasons.

DISCUSSION

In our study, most infectious websites were originated from English-speaking countries indicating their role in producing web-based health information. Also, most infectious websites managed their contents for general users, therefore a proper education on e-health and how to quality evaluation is

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Table 1: The characteristics of the studied viral infectious diseases websites

Variables	N(%)
Ownership	
Individual	3 (4.76%)
Organization	60 (95.23%)
End user	
Healthcare professional	42 (60.60%)
Genera users	44 (69.84%)
Patients	16 (25.39%)
Students	22 (34.92%)
Researchers and instructors	22 (34.92%)
Healthcare technicians	29 (46.03%)
Information type	
General	18 (28.57%)
Specialized	15 (23.80%)
Both	30 (47.61%)
Aims	
Education	40 (63.49%)
Information service	43 (68.25%)
Treatment	10 (15.87%)
Commercial	5 (7.93%)
Research	12 (19.04%)
Health service	3 (4.76%)
Missing data	2 (3.17%)
Offered Information	
Articles	15 (23.8%)
Research plans	26 (41.26%)
Chosen medical health news	38 (60.31%)
Other health links	39 (61.9%)
Online education	20 (31.74%)
Health subject index	41 (65.07%)
Feedback system	
Yes	60 (95.23%)
No	3 (4.76%)
English-speaking origin	
Yes	58 (92.06%)
No	5 (9.93%)
Website Quality Approval	
Yes	15 (23.8%)
No	48 (76.19%)

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Table 2: The associations among information evaluation results in 20 Hepatitis B websites and their obtained Silberg score

Variables	r	P
Accordance with WHO Fact Sheets		
Accuracy	0.196	0.407*
Completeness	0.202	0.393**
Website Quality Approval	0.247	0.051***

* Spearman test, $P < 0.05$; ** Pearson test, $P < 0.05$; ***Chi square, $P < 0.05$

necessary for using infectious information safely by these audiences. Most infectious websites were developed by organizations so they show a more remarkable role in e-health dissemination. Education and information services in both general and specialized levels were the focus of these websites. In addition, feedback systems that were used by more than 95% of our infectious websites can be a helpful means to communicate with end users and improve in turn the quality of websites content.

Lissman and Boehnlein (2002) found that about two-thirds of the depression pages were on for-profit. But Li, et al., (2001) studied on back pain websites and found that 44.4% were produced by for-profit and patients were the most users (63%). In another study (Allen, et al., 2002) on laparoscopy websites, the following results were obtained: twenty-eight of the 104 pages had a medical product for sale, 26 were patient-directed, 23 were written by a physician or group of physicians, and six represented corporations. Price and Hersh (1999) developed a prototype system that responds to a consumer health query by returning a list of webpages that are ranked according to the likely quality of the page contents. Intervening in the search process and automatically analyzing the contents of each page returned by a general search engine may facilitate the search for high quality consumer health information on the web.

Finding a tool that can predict completeness and accuracy of e-health websites is an aim for Quality Evaluation Initiative. In our study, there was no association between WHO completeness and accuracy with Silberg score ($P < 0.05$) but r value was strong. Also, Griffiths and Christensen (2000) could not find any correlation between the measured content features with Silberg Responsibility criterion in their websites. Pandolfini, Impicciatore, and Botani (2000) failed to find a relationship between information quality and content completeness in websites of cough in infants. Only significant correlation in our study was found between Silberg score and Website Quality Approval ($P < 0.05$). Butler (2002) found that those websites with references updated content and non-profit aims tended to have higher content quality.

Consumers are generally not aware of characteristics that indicate quality information on the Internet (Eysenbach and Kohler, 2002). Education about quality indicators including the aim and end users for the website, Silberg criteria for information provision on web such as authorship, disclosure, attribution and currency (citation, acknowledgement of risks of treatments, clear disclosure of sponsorship, affiliations or conflicts of interest) leads to increase consumer ability to access and resource quality information. The only way in navigation in the health Internet to avoid misleading health-care decisions is to continue studying about predictive rating tools for quality of health websites.

This study assessed the features and quality of website information about Hepatitis B. Future research could be directed towards investigating correlation of quality rating tools with features of content in the health websites.

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