

Determining Quality Criteria for Online Health Information: A Qualitative Study

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Abstract

The Web is an important source of information for health care consumers, and the resources they find on the Web have a direct affect on their health outcomes. Despite the enormous benefits of online health care, the quality of health information on the Internet is an area of increasing concern. Therefore, there's a need to develop quality assessment tools that can filter out poor quality online health information. The purpose of this study is to explore the critical attributes for assessing website quality and for developing quality assessment measurements. We completed three focus group discussions with 24 participants that were administered by a moderator and based on specifically focused group questions. The results suggest that the most important quality criteria, as identified by the respondents, were related to issues of credibility and accuracy. To determine the credibility of Internet health information, the respondents stated one must consider the following: the information source, disclosure of the author's or organization's credentials/qualifications, disclosure of ownership and the updating of the content. For the accuracy of content, elements such as a statement of purpose, evidence-based information, relevance and completeness should be considered. Interactivity, accessibility, and design were additional quality criteria.

Key words: quality criteria, online, health information

INTRODUCTION

The World Wide Web is easily accessible and it disseminates health information that is both accurate and inaccurate; this media for health information has the potential to grow, but it can also jeopardize the healthcare sector. In spite of its variable quality, millions of Internet users search for health information online to choose treatments, doctors, and hospitals for their specific diseases (1). Thus, there is a growing need for objective, reproducible, and widely accepted criteria that can be used to evaluate the quality of health information (1,2).

In response, many organizations have developed quality assessment tools to filter out poor quality health information (3). As a result, there are hundreds of instruments for evaluating online health information. Of these, the instruments developed by the Health on the Net Foundation (HON Foundation) and the Health Summit Working Group (HSWG) are recognized as the most credible instruments available to consumers and health professionals (4,5). HONcode has eight criteria for evaluating websites: authority, complementarities, confidentiality, attribution, justifiability, transparency of authorship, transparency of sponsorship, and honesty in ad-

vertising and editorial policy (6). HSWG has presented a set of seven criteria for evaluating the quality of health information provided on the Internet: credibility, content, disclosure, links, design, interactivity, and caveats. Each of the seven criteria consists of several elements. For example, credibility is evaluated according to five elements: source, context, up-to-date information, relevance, and the editorial review process (7).

However, previous research has found that the majority of assessment instruments are insufficient and improper for actual use in evaluating websites. For example, Eysenbach et al. assessed the quality of online health information according to five suggested aspects of website quality: technical quality criteria, design, readability, accuracy, and completeness (3). They found 70% of quality studies contained problems, such as wide differences in the quality criteria and the research method used, and lack of operational definitions for those criteria (3). Another study by Bernstam et al. examined the availability, objectivity, and readability of 273 quality-rating instruments that health care consumers can use to assess health information websites (8). They identified that only a few can be practically used by the intended audience. In other studies that have evaluated the content and qual-

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ity of information for specific diseases such as menopause (9), diabetes (10), and carpal tunnel syndrome (11), the evaluated websites were shown to provide low quality, biased, or useless information.

With the exception of studies performed by Lee et al. (12), Sohn (13), and Kang et al. (14) there has been scant Korean research assessments of the quality of website health information and identification of criteria for Web evaluation. Lee et al. adapted three models taken from the international literature; they compared and modified their criteria, and then laid down an evaluation set that consisted of six criteria: authority, accuracy, objectivity, current content, coverage, and convenience (12). Sohn developed an instrument based on previous studies, which was based on content, authorship, purpose, page aesthetics, functionality, available contact addresses and feedback mechanisms, and privacy (13). Finally, Kang et al. monitored the appropriateness of online nutrition information. Although they evaluated 497 websites using criteria based on clarity, purpose, authority, durability, advertisement, privacy, responsibility, and content, they did not demonstrate operational definitions for each of the employed criteria (14).

The studies mentioned above identified quality criteria for online health information using guidelines that were based on published international research. However, no study has been conducted to determine the specific quality criteria important to Korean Internet users who seek health information. Because many different health and social environments, health-care decisions, and mechanical factors related to the Internet influence website quality criteria, and also because these websites proliferate enormous amounts of highly variable health information, the quality criteria established in previous international studies may be different than those for Koreans. In addition, there is a unique need to identify criteria that are clear in terms of evaluating content quality and technical support. Identifying specific criteria will help the general public, policymakers, health professionals, and providers of Web-based health care assess and monitor the quality of the online health information they use.

The purpose of this qualitative research study was to explore the dietician's perception of the quality criteria that are intended to be a resource and tool for evaluating health-related information on the Internet, and to determine whether the criteria are usable and credible. This research has implications for the development of more effective assessment instruments that can be focused at assessing the quality of health information on the Internet.

METHODS

Study design and study populations

For this study, we collected data using focus groups to promote idea generation via group discussion. Qualitative research methodology has been proven to be an effective method for gathering information when examining human-computer interactions (15). This study chose to survey dieticians as a representative sample of health professionals. The specific population consisted of dieticians in University settings located in Korea's southern province. At the time of the study, the participants were graduate students enrolled in the class *Information Management of Food and Nutrition*. This class provides knowledge and skill development in applying the principles of nutrition and food to menu planning, staff training, patient teaching, and maintaining high standards of food quality.

Description of focus group and data analysis

We held three focused group sessions in May, 2005 with six to nine participants each (a total of 24 women dieticians, mean and median age: 43, range: 26~52 years). Each session was coordinated by a moderator and it took approximately one hour. The focus groups were tape recorded with the consent of the participants. The moderator took notes during each focus group meeting for later analysis. After each focus group meeting, taped transcripts and field notes were incorporated into the analysis process. Significant patterns in focused group responses were grouped according to common themes by comparing and contrasting. The responses remained confidential and anonymous.

Focus group questions

The questions used in the focus groups are presented in Fig. 1; they were primarily aimed at identifying the quality attributes of the criteria used to assess the credibility and usability of websites that provide health information. The questions were developed based on a literature review of online health information (3-8,15). The participants were asked about their previous experiences, needs, expectations, and problems with respect to accessing health information on the Internet. An emphasis was placed on how consumers appraise the quality of information. The researchers asked the participants to describe what attributes influenced their evaluation of website quality. A semi-constructed style of questioning was used during each session to ensure consistency in the questions asked across the different groups. To get the most useful information, more specific questions were asked when necessary.

What has your experience been with using the Internet?
 What role do you expect the World Wide Web to play in providing health information for Internet users?
 What percentage of health information provided on the World Wide Web would you believe?
 What are some ways consumers could become more confident with health information on the internet?
 Do you think the quality of online health information was accurate? Why or why not?
 What are some ways that consumers could communicate more effectively when gathering health information on the Internet?
 What has been easy for you when searching health information?
 What has been difficult when searching for health information?
 What attributes/characteristics do you use to determine the quality of websites?
 What suggestions do you have for creating websites that provide health information?

Fig. 1. Focus group questions.

RESULTS

A high level of interest in online health information

The participants had very positive impressions about the potential role of online health information for the following applications: patient education; disease prevention for the general public; access to highly detailed information; convenience and shared decision-making; self management for the treatment of disease; and forums for patient support groups. When investigators asked what role the World Wide Web plays in providing health information, the participants made a number of concrete statements. The major statements mentioned most frequently were “information obtained through the Internet can be very easy to find and detailed, but it can also be overwhelming” or “the Internet is a convenient tool for the sick and their families, as well as an educational resource for those who want to stay well”.

Other statements included, “the resources consumers find on the Web have a direct affect on the decisions they make about their health care, and on their interactions with doctors”, or “today’s patients are able to get more information via the Internet than from a clinician, and it’s a way to cope with the authoritarianism of the medical profession”, Even though patients perceive physicians as the highest-ranking health authorities, they also sense the limited time and effort medical professionals can put forth in sharing information with them, suggesting that patients may be more likely to search for information on the net.

Finally, one third of the participants put a premium on the role of consolation, which can come through sharing ones own plight in Web forums. Nine participants suggested “health seekers appreciate the convenience of being able to find information on the Internet at any hour”, or “the Internet easily provides health seekers specific answers to targeted questions”.

Potential problems related to the quality of online health information

For most focus group participants, the quality of online health information has acquired a remarkable improvement in the past decade. Many participants held a strong belief that the value and quality of online health information is important. Yet, most had low levels of confidence in the quality of the information, implying that it is extremely variable, insufficient, and its accuracy and credibility are unconvincing. Misinformation was a problem for most participants. For example, many suggested “the credibility of health information and health advice on the Internet is a serious concern” or “consumers can easily be misled by the incomplete, inaccurate, outdated, or even outright biased health information they find on the Internet”.

Some participants said that “consumers are lacking knowledge on how search engines retrieve results, as well as on the impact of paid placements for health website listings,” or “consumers are hindered by access barriers, in addition to the difficult scientific terminology”. Eight participants stated, “one of our greatest challenges is helping consumers find the accurate and reliable information they want, which is also presented in an accessible format”, and “a better approach would be to empower patients to evaluate online content for themselves”.

The participants described several specific problems regarding the quality of online health information such as the excessive for-profit sites on the Web that are particularly susceptible to poor quality; obligatory payments to websites for accessing information and unnecessary procedures for creating secure transactions; anxiety about privacy protection; content that is not updated regularly; and absence of an evidence-based ranking of the information offered. The following comment was made by one focus group participant: “When I try to seek health information, the problem I find is that there’s no clear distinction (visual or by text) between what is advertising and what is content. How then can I trust the quality of the content, and continue to search for information?” Also, another participant stated “I believe that about 90% of health websites are selling products and services”.

Attributes determining the quality of online health information

The participants provided various attributes when asked to describe the quality criteria for evaluating online health information. These attributes were categorized into 2 levels on the basis of the frequency and extensiveness with which the participants talked about them. In descending order of the frequency they were mentioned Level-1 attributes that included credibility (i.e., original source stated, author's credentials, ownership, updated content) and accuracy (i.e., statement of purpose, evidence-based information, relevance, completeness). Level-2 attributes were not mentioned as frequently as the Level-1 attributes, yet they could be primary factors for some of the participants. These included interactivity (feedback, chatrooms, internal search engines), accessibility (quick overview, user friendly, readability), and design (size of font, site features, pictures and graphics). Representative quotes from the participants that illustrate these attributes are presented in Fig. 2.

Based on our focused group discussions, the quality criteria for the evaluation of online health information

Level-1: Attributes perceived as most important

Credibility

"I desire to confirm where the information comes from. If it includes the qualifications/credentials of the organization or authors, the site was perceived to be credible."

"I consider it to be reliable if the information is from public institutions or scientific publications."

"When I see the page saying 'last updated in 1990', I don't intend to go any further."

Accuracy

"I expect that the text be based on evidence or sound science, and the treatments discussed don't have any side effects."

"I would like to know if the information is selected according to scientific criteria or personal experience."

Level-2: Attributes of secondary importance

Interactivity

"Site mechanisms to step up and join in on information exchange, feedback mechanisms and open forums such as chat-rooms, email addresses, and Q/A corners are needed."

"I expect a site to provide links to other sites."

Accessibility

"I wish to have a quick overview of what is on the site."

"The text should be in a comprehensible style, and this is really, really important."

Design

"The professional presentation and whole appearance must be pleasing, and this is important."

are suggested as follows and are summarized in Table 1, along with descriptions of each attribute:

Credibility: To determine the credibility of Internet health information, one must consider the information source, disclosure of the author's or organization's credentials/qualifications, disclosure of ownership, and whether the content is up-to-date. Of these, the source of medical information is the most important criteria for its credibility and quality. The names of the institution and organization responsible for the information, as well as the authors and ownership, should be disclosed. Also, a website should include the qualifications and credentials of the organization and authors. If sponsorship is disclosed, it can help consumers evaluate the motivations behind the provided information.

Accuracy: The accuracy of Web content should be based on the following: a statement of purpose, evidence-based information, relevance, and completeness. The website's purpose should be clearly stated, and the information provided should be relevant to that purpose. Clinical or scientific evidence should also be clearly stated. Users should be provided with pertinent facts and negative results, and a statement regarding any information not provided about the subject should be included.

Interactivity: There are three criteria for evaluating the quality of interactivity. The first is feedback mechanisms such as chat rooms and outbound links. Websites should include a feedback mechanism for their users so they can offer their comments, corrections, and criticisms, and raise questions about the information provided. The ability to send an email or a way to contact the site owner should be provided. Second, if a site provides a chat room, there should be a statement whether or not a moderator is present, and a warning that the information may not be accurate. Last, an internal search capability is a highly desirable component to search for information and to further recommendations of websites.

Accessibility: The accessibility of websites can be defined in terms of multimedia browsers/maps, readability, and user friendly functions. Websites should be accessible by the lowest level of browser technology that is currently available. Features should include multimedia browsers or maps to improve access and options, which can enable website use by the hearing and visually impaired, as well as the elderly. Finally, the quality of the written language must make the website easy to read and understandable.

Fig. 2. Quotes from focused group participants of online health information.

Table 1. Suggested quality criteria for evaluation of online health information

Quality criteria and elements	Descriptions
Credibility	<u>The degree of trustworthiness toward the information and the subject organizing or operating the website.</u>
Source	Presence of references, expert opinions, or bibliographies.
Author's or organization's credentials/qualifications	Presence of person or organization's name, credentials, or qualifications.
Ownership	Identification of the entity that owns the information presented on the website.
Updated Content	Date disclosed of any revisions or updates.
Accuracy	<u>The degree of concordance of the information provided, within the best evidence or generally accepted medical practice.</u>
Statement of purpose	Clearly stated purpose or aim behind the website.
Evidence-based information	The percentage of scientific and evidence-based material.
Relevance	The percentage of relevant material.
Completeness	The percentage of comprehensive and balanced material.
Interactivity	<u>The functions that enable users to offer their comments, corrections, and criticisms, and raise questions about the information provided, and to search information within and among sites.</u>
Feedback mechanism	Presence of email, telephone, fax, or online forms for making contacts, and a channel for exchange or communication among users.
Outbound links	Presence of internal or external links for further information.
Accessibility	<u>The convenience to be accessible at any level of available browser technology.</u>
Multimedia browsers	The presence of multimedia browsers or maps for quick overview.
Readability	The quality of the written language, which makes the content easy to read and understand.
User friendly function	The convenience functions for ordinary users, as well as for those with special needs, like the sick or elderly.
Design	<u>The subjective design features such as the layout and the visual aspects of the site.</u>
General visual	Aesthetic appearance of the website.
Layout	A format suitable for finding relevant website pages.
Graphics/texts	The proper number of pictures or graphics to create easier searching, and appropriate size of font to aid in reading the website.

Design: Even though it does not affect the quality of the information, subjective design features such as the visual aspects of the site, graphics/text, and layout are important for effective delivery and easy navigation. The design as a whole must be pleasing, as well as helpful for quick exiting of the site, and easy navigation backwards and forwards should be possible.

DISCUSSION

Although many rating instruments for online health information continue to appear on websites, most, including ours, are limited by the constantly changing nature of the Internet. Also, organizations that gave rise to such instruments may no longer even exist (16). For this reason, it is more important to focus on updating quality assessment instruments rather than simply monitoring the quality of the current instruments. Our search of the literature and Internet revealed that a large number of researchers, organizations, and website developers are exploring alternative ways to help people find and use high quality Internet information (Table 2). A European

project has recently recommended the accreditation of healthcare related Internet sites (17). In Korea, we can no longer ignore the issues of quality control for Internet health information or the development of quality assessment instruments that are available on websites.

To the best of our knowledge, this is the first qualitative study carried out in the field of online health information that investigates the quality criteria for evaluating Korean websites. Our studies strength was that the participants were very thorough in answering questions and describing the criteria, and they consistently detailed the elements related to each criteria. The results of our study suggest five quality criteria and 17 elements for assessing online health information. The definitions of those criteria and their elements were described above. The most important quality criteria were related to issues of credibility and accuracy. To determine the credibility of Internet health information, the respondents stated that one must consider the following: the information source, disclosure of the author's or organization's credentials/qualifications, disclosure of ownership and the updating of the content. For the accuracy of content, elements such

Table 2. Initiatives to organize and identify valid health information on the Internet

Organizations	Product	Description
US Department of Health and Human Services (www.healthfinder.com)	Healthfinder	A directory of health resources selected according to explicit criteria.
Health Summit Working Group (http://hitiweb.mitretek.org/hswg/)	Information quality tool	21 criteria by which consumers can evaluate websites.
Health on the Net Foundation (www.hon.ch)	HONcode	8 criteria to guide development of website content.
Internet Healthcare Coalition (www.ihealthcoalition.org)	e-Health code of ethics	14 criteria by which consumers can evaluate websites.
Hi-Ethics Principles (www.hiethics.com)	E-Health seal	14 criteria to guide development of website content.
American Accreditation HealthCare Commission (www.urac.org)	Health website accreditation program	53 criteria to guide development of website content.

as a statement of purpose, evidence-based information, relevance and completeness should be considered. Interactivity, accessibility, and design were additional quality criteria. These criteria have implications for the development of more effective assessment instruments and assessing the quality of health information on the Internet.

Finally, further studies will be needed to conduct an overall evaluation of the quality criteria identified in this study. Specifically, their ability to identify high quality disease or condition-specific information on the Internet, as well as verifying their ability to screen out inaccurate or potentially harmful health information needs to be evaluated. We hope that our findings will encourage further research regarding quality assessment tools that can be used by policymakers, health professionals, and providers of Web-based healthcare, as well as by consumers without specialized training, for assessing and monitoring the quality of online health information.

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