

Evaluating Personal Health Care and Health Promotion Web Sites

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Summary

Objective: An exemplary sample of web sites relevant to personal health care and health promotion was chosen and evaluated.

Methods: Both quantitative and qualitative data were converged to assess and rank the sites on nine attributes.

Results: The sites provided a definitive range of value and variety of presentations, health care and health promotion information, and services covering the virtual choices currently available to users of the Internet.

Conclusion: Discussion focused on methodological approaches and issues of web site evaluation serving the public interest, health care, and health promotion.

Keywords

Health care, health promotion, methods, web site evaluation

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Introduction

The year 2001 marked the tenth anniversary of the first U.S. Web site [1]. Web sites have been available to the general public for the last 12 years. In 1996 the International Webby Awards were created by Tiffany Shlain. The following year, the Webby Award category “living/health” was established [2], and the health promotion web site, Reuter’s Health Information (www.reutershealth.com), won first place.

Today individuals in the United States commonly look to the internet for information about personal health issues ranging from self maintenance and personal health insurance to medical information to understand their own symptoms. Users seek to diagnose their maladies and compare their information with that received from their physicians. According to Rainie [3], a member of the health sites panel discussing Building Trust on the Web, “about 80% of U.S. Internet users have gone online to get health diagnose[s] or find out what’s wrong with them; to get second opinions ... about what they have and how to treat it; to check out doctors and check out hospitals they might be going to; to go to support groups.”

The visibility and popularity of health promotion web sites are more evident than ever in the health care scene.

Objectives

Questions naturally arise for patients and providers alike about the choices, variety, quality, comprehensiveness, readability, usability, and accuracy of their contents. With such questions in mind, we examined a sample of web sites promoting individual responsibility for personal health.

Methods

Purposive sampling and saliency were the means and criterion, respectively, we used to obtain the sample. From prior work evaluating web sites [4] and internet research [5], we defined eight categories of Internet sources one would most likely find content on personal health promotion. The sampling consisted of one salient web site from each of the following categories: health maintenance organizations, insurance companies, cyberspace sites, self help groups, hospitals, government, universities, and non-profit organizations.

Since www.google.com has become the number one search engine [6] for locating information on the World Wide Web, we employed it to facilitate the sampling. We typed in the search window the phrase “personal health promotion and” the category name we were searching. For example, we entered “personal health promotion and cyberspace,” and Cyberspace Clinic appeared on the first page of resultant links. In the case of a Health Maintenance Organization (HMO), we selected Kaiser Permanente Medical Group because it is the nation’s largest prepaid group-practice and HMO [7], after it was apparent the search engine did not readily yield a specific HMO early in its listings. The first insurance site to appear was Metlife. Although not immediately evident in the search listing, Medline was the most visible government site. Mt. Sinai in Washington, D.C. appeared first in the search of hospitals. Stanford Health Promotion Research Center, the university’s medical web-based site, was chosen because of its saliency that included partial access to the public domain. Evident as the self help category, Support, Self-help, and Campaigning Groups appeared first in the search result. Our final category, the non-profit sec-

tor, yielded The Wellness Councils of America. Even though our study was not intentionally limited to the United States, of the sites that first appeared in our searches we selected, seven were located in the United States and one (Support, Self-help, and Campaigning Groups) was based in the United Kingdom. The sample of evaluated sites are listed in Table 1.

To confirm the relevance of key attributes and to generate criteria for each attribute that would enable us to evaluate the sample, we asked ourselves the question: "To what degree and in what ways does this site endorse and subscribe to the individual taking personal responsibility for his and her own health?" Lang [4] and others [1, 7-9] have established attributes and defined criteria for web site evaluation. Such attributes as navigation, interactivity, and noise were taken to be central to our study, where e-commerce was not. The set of attributes we used to evaluate the web sites (Table 1) were operationally defined (Table 2).

Criteria qualities such as credibility, trustworthiness, expertise, and believability were not directly considered in this study since these involve the *perception* of the viewer and an evaluation of "multiple dimensions simultaneously" [9]. Rather, we evaluated individual dimensions of the sites and compiled the findings for each criteria. Inquiry into the experiential quality of those visiting the sites would have required the additional methods of interviews and surveys. It is believed for example, quality criterion such as credibility of the site, can be surmised from the multiple data presented. According to Fogg and Tseng [9], "scholars agree that credibility perceptions result from evaluating multiple dimensions simultaneously" and that "the literature varies on how many dimensions contribute to credibility evaluations".

Reviewing the accuracy of content as a criterion was deemed beyond the scope of this study. However it has been found in previous research [10] that website visitors knowledgeable with the subject being investigated are more rigorous in their evaluation of the material.

Along with the qualitative descriptors, we included a numerical definition, ranging

Table 1 Eight health promotion web sites

Cyberspace Clinic (CC) http://mprofoca.co.net/clinic08.html
Kaiser Permanente Medical Group (KPMG) http://www.kaiserpermanente.org/
MetLife Insurance (MI) http://www.metlife.com
Medline Plus Health Information (MPHI) http://www.medlineplus.gov/
Mt. Sinai Hospital, NYC (MSH) http://www.mountsinai.org/msh/msh-home.jsp
Stanford Health Promotion Research Center (SHPRC) http://hprc.stanford.edu/resources2.asp?video
Support, Self-help, and Campaigning Groups (SSCG) http://www.support4learning.org.uk/counsel/support.htm
The Wellness Councils of America (WELCOA) http://www.welcoa.org/wellworkplace/index.php?category=7

from one to five. One was the lowest level of representation of the attribute, three the middle value, and five the highest value of the attribute. But for noise, it was the converse; the fewer distractions, the more positive was assumed to be the experience of the person visiting the site. We took the qualitative and quantitative aspects of assessment

Table 2 Attributes used to evaluate the web sites

<u>Presentation</u> : colors, layout, fonts, size of text, menu, sounds, multi-media, pictures ranging from still to moving.
<u>Language</u> : different languages, composition of text, idiomatic terms and expressions, jargonistic.
<u>Noise</u> : banners, pop-ups, advertisements, distractions such as "things" not directly relevant to the theme of the site.
<u>Audience</u> : who is the site written for, age range including adolescents, teens, young adults, adults, and seniors, multi-culturalism, professionals, lay persons.
<u>Content</u> : relevant to the site from directly to indirectly, and tangentially, level of education ranging from primary to secondary, tertiary, and professional.
<u>Navigation</u> : ease in moving from one page to another throughout the site.
<u>Interactivity</u> : read only, ask and answer simple questions, search and browse, simulation such as with dexterity, vision, hearing, chat rooms, physicians and other specialized doctors available in real time.
<u>Vocabulary</u> : simplicity and complexity of words, specialized words, length of words, basic vocabulary and advanced vocabulary.
<u>References</u> : links to other places on the subject, sources on the subject, authoritative voices on the subject.

to comprise our operational definitions to guide us in our task of site evaluation.

Each website was evaluated three times with an estimated 30 minutes for each visit. Initially, we independently examined the eight web sites based on the established criteria. Next, while visiting the sites together, we discussed and rated them on these nine attributes. We then reached a consensus between us on the nature and extent of each attribute in every site. In a final review, the lead research re-visited each site for consistency of the data reported.

Results

The qualitative results are found in Table 3. Two to three color schemes characterized the sample of web sites. Text was the principal means to convey content, but half the sites made use of a variety of photos, mostly single persons. English was dominant in all, but Spanish was a choice in one (MPHI) and one site (SSCG) had links to other languages. Noise did not seem that evident, though three sites (CC and KPMG, and SSCG) had low levels, such as a banner or billboard. Audience varied greatly across sites as did content. Navigation was easy in most sites, mixed in one site (KPMG), and difficult in one site (MI). Interactivity showed spread of options across sites. Most sites were read only sites, but there were other options, specifically chat rooms in CC and SSCG, tutorials and courses in MPHI and SSCG, and appointment and prescription services in KPMG. All sites used basic vocabulary, but three sites (CC, KPMG, and MPHI) included specialized and technical vocabulary as well as links to specialty area publications. References to sources of information and links to other sites for further information were present in all sites but one (WELCOA).

The quantitative results are presented in Table 4. To complete the last column of Table 4 for each site, we added the numbers of the row in all categories but noise, then subtracted the noise value to get a general unweighted sum. This crude measure allowed us to make rough comparisons among the sites. The sites were ranked, producing

Table 3 Descriptors for nine attributes applied to the sample of eight health promotion web sites

<p>Cyberspace Clinic (CC) http://mprofaca.cro.net/clinic08.html Presentation: color is green background with dark red titling and black text; social café-lets talk; 12–36 font size Times and Helvetica. Language: English only. Noise: Banners top and bottom Audience: Patients (wellness web), economic and socially disadvantaged minorities, women, children, elderly, travelers. Content: Psychology testimonials, articles, and scholarly publications. Navigation: 6 kinds of software required to use the site, e.g. Acrobat to Media; Player, Shockwave; pages not found 3 times and could not return to homepage. Interactivity: Chat rooms, examples: prostate cancer center, grass roots; illness and political issues; username and password required to participate in chat rooms. Vocabulary: Ranged from simple to scholarly, specialized words, basic and advanced vocabulary ranging from primary to professional. References: Patient advocacy groups, research and treatment centers, reprints.</p>
<p>Kaiser Permanente Medical Group (KPMG) http://www.kaiserpermanente.org/ Presentation: Blue color, black/white text theme, still pictures and photos; variety persons and couples; 12–14 font size Times font. Language: English only. Noise: Low, one window with rotating messages, no banner and no pop-ups. Audience: Directed to members but public access to health information. Content: Homepage left column menu to member services, health information, health plans, locations, news, employment opportunities, and emergency preparedness; regional homepages for health topics, detailed medical and drug encyclopedias, medical staff directory. Navigation: Mixed; frequent dead end pages, requiring backtracking to member services page. Interactivity: Mostly read only, very limited; ability to make appointments and fill prescriptions. Vocabulary: Predominantly basic and simple words, though specialized and technical words in the encyclopedias. References: Links to other major health related organizations, such as World Health Organization, Center for Disease Control and Prevention.</p>
<p>Metlife Insurance (MI) http://www.metlife.com Presentation: Blue and white, still picture, little children, father with child, and seniors; 8.5 font size Arial font; Snoopy cartoon characters. Language: English only. Noise: No banners and no pop-ups. Audience: Catered to secondary educational level, disabilities and aging, written for the general public. Content: Topics exceeded health to include social security, government tax credits, brokers, yet no physician links on the home page, mixed tangential and relevant material. Navigation: Terrible, pages froze. Interactivity: Read only very limited. Vocabulary: Basic and simple. References: Links to other sites such as the surgeon general and the American Cancer Society, but limited in topics to choose from and then the material available was limited.</p>
<p>Medline Plus Health Information (MPHI) http://www.medlineplus.gov/ Presentation: White page background with blue topic lettering and green sub-topic lettering; Arial font, font size 10; homepage has three columns of topics to link including government medical trials; tutorials, current health issues, featured site that one can link and topic in the spotlight. Language: English and Spanish. Noise: None. Audience: All age groups, all education level groups including professionals. Content: Health topics in general, medical encyclopedia (highly comprehensive complete with definitions, symptoms, prevention, illustrations, alternative names, treatment), drug information, health news in the past 30 days. Navigation: Easy. Interactivity: 165 interactive tutorials with sound, written text, and pictures; ability to give feedback to Medline on the experience of the site. Vocabulary: Range from very basic and simple to professional with links to references. References: Libraries, organizations, government health sites from other nations, articles, abstracts, links to full articles.</p>
<p>Mt. Sinai Hospital, NYC (MSH) http://www.mountsinai.org/msh/msh-home.jsp Presentation: Blue and tan, top aerial photo of the hospital, left column main menu under patient care and professional services, and to the right three columns of many entries each with still picture of person, groups persons, objects. Find a doctors, services, in the news; 10–14 font size, Times font. Language: English only. Noise: No Banner and no pop-ups. Audience: General public. Content: Finding a doctor, services and departments, centers and institutes, diseases and conditions, research, news. Navigation: Easy. Interactivity: Read only, very limited. Vocabulary: Basic and simple. References: Links to other sites, for example in diseases and conditions.</p>

the following order from most impressive site on personal health promotion to the least impressive, according to the resultant total value across the nine attributes: MPHI,

SSCG, CC, KPMG, MSH, SHPRC, MI, and WELCOA. Although we could not know the exact distances in this rank order, there appeared to be groupings. MPHI stood out

from the pack, SSCG and CC were difficult to distinguish as the second most impressive, KPMG and MSH were spread in the middle, SHPRC and MI were indistinguish-

Table 3 Continued.

<p>Stanford Health Promotion Research Center (SHPRC) http://hprc.stanford.edu/resources2.asp?video Presentation: White background with black text, running horizontal menu, 10 point font size, Times font. Language: English only. Noise: No banner and no pop-ups. Audience: Free to Stanford students and faculty, annual fee for individual subscribers, but general public can view a few videos, a class, and purchase health promotion books and videos. Content: Horizontal menu of classes, streaming videos, health assessments and kits catalog, mostly requiring membership, on range of topics, such as cancer, heart disease, managing back pain, stress. Navigation: Easy Interactivity: Read only, very limited. Vocabulary: Basic and simple. References: No links to other sites.</p>
<p>Support, Self-help, and Campaigning Groups (SSCG) http://www.support4learning.org.uk/counsel/support.htm Presentation: Purple, rose, and blue colors and letters; font size 12, Arial font. Language: English, but some links to German, French, and Spanish. Noise: Two small changing "bill boards" at the top of the page. Audience: Women (birth control, pregnancy, and child birth), travelers, environmental health, addictions (smoking, alcohol, gambling), stress, fitness and sports, dental and oral health needs; health professionals and volunteers, disabilities. Content: 45+ Self-help, support and campaigning groups listed on home page, this list was last updated September 2002; site sectional index covering nine distinct areas such as community, education, health, references. Navigation: Easy, pages appear quickly; well organized indexed subject that link to specifics on the topic. Interactivity: Advice online, interactive resources & support such as Cyberdocs Surgery - live keyboard "chat" with US physicians; online course on health; multilingual information on taking medicine, games, health quizzes, questions and answers, questionnaires. Vocabulary: Basic and simple. References: Provides links to directories of medical and general health resource sites, International Directories and General Resources.</p>
<p>The Wellness Councils of America (WELCOA) http://www.welcoa.org/wellworkplace/index.php?category=7 Presentation: Black print on a white background; homepage is a listing of books, "key resources" including picture of the source manual and a one paragraph summary of the source; each source has a link: 10-14 Geneva font. Language: English only. Noise: None. Audience: People in the work force; those interested in researching and implementing health and wellness in the workplace. Content: Information for those promoting wellness in the workplace. Navigation: Easy. Interactivity: Limited. Vocabulary: Basic and simple. References: Listed on the homepage, limited</p>

ably less impressive, and WELCOA fell markedly below all the rest.

Discussion

Our experience of navigating the sites and converging on descriptions led us to several qualitative comparisons and impressions, beyond the determination and presentation of descriptors. Like Duffy et al. [11], we found many of the sites oriented to both lay persons and professionals. The Internet's "rapid connection of users and materials locally and globally make it an ideal health promotion medium, for both the public and professionals" [11] (p. 27). The most comprehensive site we examined was MPHI for

Table 4
Extent of nine attributes in eight health promotion web sites*

	P	L	N	A	C	No	I	V	R	T
CC	3	1	3	5	5	1	5	5	5	27
KPMG	3	1	3	3	5	3	3	3	5	23
MI	3	1	5	3	3	1	1	1	3	11
MPHI	5	3	5	5	5	5	5	5	5	33
MSH	5	1	5	3	5	5	1	1	3	19
SHPRC	3	1	5	3	3	5	1	1	1	13
SSCG	3	5	3	5	5	3	5	1	5	28
WELCOA	1	1	5	3	3	1	1	1	1	7

*CC = Cyberspace Clinic, KPMG = Kaiser Permanente Medical Group, MI = MetLife Insurance, MPHI = Medline Plus Health Information, MSH = Mt. Sinai Hospital in New York City, SHPRC = Stanford Health Promotion Research Center, SSCG = Support, Self-help, and Campaigning Groups, and WELCOA = The Wellness Councils of America. P = Presentation, L = Language, N = Noise, A = Audience, C = Content, No = Navigation, I = Interactivity, V = Vocabulary, R = References, and T = Total score.

coverage of information on personal health promotion in the public domain. This government site catered to a wide range of persons from the lay visitor to the professional. WELCOA appeared more limited to visitors who are strictly interested in researching and implementing health and wellness in the workplace. As one might expect, KPMG and SHPRC targeted predominantly their patients and medical personnel, and students and faculty, respectively, though both sites provided information to the general public. Where six sites provided the public with their information free of charge, CC and SHPRC requested a fee for full access. CC required vast amounts of software to operate and reap the full value of their site. We saw this as a potential negative since some users may not have the hard drive capacity and/or necessary software. On the positive side, the software could enhance the visitor's experience, providing video, graphics, interactive ways of acquiring information, and sound, for example heart beats. SSCG appeared very thorough, easy to navigate, little to no distractions, wide audience, many opportunities for interactivity, and several languages via links to other sites, though site colors could be toned down. Of the sites comprising this sample, MSH gave us the impression in its design and format to be most cast like a news web site, highlighting its medical services and news. Finally, as one might expect from its products and services, MI exceeded health promotion content to include such subjects as government tax credits and social security. We did not find this kind of extension in the other sites.

The findings and interpretations presented in this paper are limited to the time of their retrieval off the Internet. The sample of most salient web sites in the area of personal care and health promotion could change rapidly. For example, during the period of our evaluation, KPMG reposted its web site. Currency depends on the browser search algorithm, maintenance of the web sites, and user activity. Regardless of the tenuous time-bound character of web sites, users likely will favor a user strategy for ready access to top sites that yield what they seek to know in a trustworthy, understandable, and efficient form.

Another limitation was the use of only one browser to find sites from which to sample. It could likely be that we would not have had any sampling difficulty had we used a small sample of leading browsers to generate the population of sites. Such a population might yield a more representative sample of the most salient personal health promotion web sites on the Internet.

Not included in the evaluation of web sites were book reviews, tapes, and prostheses, e-commerce, sales of over the counter drugs, patient and consumer polls and e-surveys. There are interactive sites and repositories of self-help and support groups not tapped in this study. All of these sites represent possible areas for future research in web site evaluation relevant to personal health care and health promotion.

In addition, we did not explore sites outside of mainstream medicine in the United States, specifically, complementary and alternative medicine, folk remedies, Tibetan and Chinese medicine, and indigenous ways of knowing. These are large areas of content having some bearing on health promotion, and undoubtedly millions of web site users include them in their search for health promotion-related information. Select web sites promoting these areas may be sources that generate attributes and criteria that were not part of our research but should have been to make it more comprehensive and useful to the consumer-driven utilization of the Internet for health care and health promotion. We speculate that these kinds of web sites may deserve study in themselves, regarding the development of attributes and criteria for health promotion.

Finally, a means of expedient appraisal, such as the easy-to-use template for web site evaluation (Table 4) demonstrated here, brings to the user a more informed look at whether a particular web site facilitates their interest in personal health promotion. The nine attributes are not meant to be exhaustive, but they are representative of a recognized set applied in the field of web site evaluation that may be useful to users seeking the most informative, expedient, and user-friendly sites.

Persons surfing web sites for health-related concerns likely use informally many

of the same attributes we used to evaluate the exemplary sample. Such attributes can contain implicit criteria. Persons evaluate for themselves whether a particular web site contains what they seek to know about themselves and those dear to them. For example, what are the choices of health promotion web sites available with information on a specific illness and its treatment? What is the quality of the information, in terms of its accuracy, comprehensiveness, and readability? Certainly there is the impression of how easy it is to navigate through the contents of the site to learn about diseases, symptoms, treatments, and drugs that will prompt them to return to this site and recommend it to others. How well do their implicit attributes and criteria apply to the web site of their HMO? Can they rely on the web site of their HMO for accurate, reliable, and readable information about the resources and services available to them?

Research based on the user (patient, consumer) attributes and criteria of web site evaluation represents a contrast to those we have cited as well as utilized in this study. Certainly, the two approaches to web site evaluation would overlap significantly, but it is our recommendation that future research include verifiable user-based attributes and criteria as part of web site evaluation.

Whether within a specific site for health promotion or other sites not included in this study, sites relevant to alternative and complementary medicine are becoming increasingly important, given the growing number of consumers surfing these sites.

Conclusions

The reports of the contents and evaluation of the specific web sites found in this paper are merely snapshots in time. The value of this study lies in the attributes and criteria used for web site evaluation applied to health care and health promotion. The approach taken to web site evaluation demonstrated its feasibility and applicability. Given a predefined scheme of eight categories covering the kinds of sites likely to have information on personal health promotion, the search

browser can be a ready means to find salient personal health promotion web sites in a category. The category scheme readily made possible succinct descriptions and ratings to compare and contrast the sites, and gain meaningful impressions regarding their usefulness, accessibility, and relevance to personal health. The sites showed a wide range and variety of presentations, health care and health promotion information, and services to exemplify the virtual choices currently available to all users from proactive health enthusiasts and patients to physicians, pharmacists and other health care professionals.

References

1. Webby history. 2003 [cited September 8, 2003]; Available from: http://www.webbyawards.com/main/webby_awards/history.html
2. Archive nominees. 2003 [cited September 8, 2003]; Available from: http://www.webbyawards.com/main/webby_awards/arch_noms_1997.html#living
3. Rainie L, Turov J, Goldschmidt P, et al. Building Trust on the Web. Health Sites Panel. Consumer WebWatch's First National Summit on Web Credibility. 2003 [cited June 19, 2003]. Available from: http://www.consumerwebwatch.org/summit2003/printfriendly_transcript_health.htm
4. Lang J. Evaluation of 30 health consciousness and personal health area web sites. Westlake Village, CA: The MedWell Group, Inc.; November 2000.
5. Petrohilou K, Collen A. Doing psychological research on the Internet. In: Lobodzinski S, Tomek I, editors. WebNet 97: World Conference of the WWW, Internet & Intranet; 1997; Charlottesville, VA: Association for the Advancement of Computing in Education; 1997.
6. MoreVisibility industry stats – August, 2003, 1999–2003. 2003 [cited September 12, 2003]; Available from: <http://www.morevisibility.com/index.html>
7. About Kaiser Permanente. 2003 [cited October 9, 2003]; Available from: <http://www.kaiserpermanente.org/about/whoweare.html>
8. Sinclair J. Online health sites a worldwide worry. The Sydney Morning Herald: September 16, 2003.
9. Fogg B, Tseng H. The Elements of computer credibility. In: CHI '99; 1999 May 15–20, 1999; 1999.
10. Honaker L, Hector V, Harrell T. Perceived validity of computer versus clinician-generated MMPI reports. Computers in Human Behavior 1986; 2 (1): 77-83.
11. Duffy M, Wimbush E, Reece J, et al. Net profits? Web site development and health improvement. Health Education 2003; 103: 278-85.

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