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HEALTH INFORMATION WEBSITES: IS THE HEALTH CONSUMER BEING WELL SERVED?

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Abstract

Increasingly health consumers are looking to the Internet for health and medical information. In response to this government and government agencies are establishing websites to provide consumers with better access to health information. Health consumers however, face numerous problems searching health information websites including poor quality information, difficulty in finding relevant information and poor website usability. Further, while there is much research on trust and quality of health information, there is little on the effectiveness of health information websites from the consumer's perspective. This paper argues that for a health information website to be effective it must engender trust in the health consumer, have features and functionality that help users retrieve relevant information and be easy to use. This paper presents the results of a research project that examined Australian health websites from the perspective of quality, functionality and ease of use. We found that few health websites provide information on quality, limited use of technology is made to improve information retrieval and the usability of health websites is less than ideal. The research also identified factors that impact on the users’ perception of quality and overall effectiveness of websites and provides recommendations for designing more effective health information websites.

Keywords: health portals, information retrieval
INTRODUCTION

Spending on health will continue to rise as populations age. Many governments and medical/health agencies worldwide see the Internet as a cost-effective way to deliver health information. The Australian government, like other governments, is proactive in developing medical websites to disseminate medical information. A major reason, apart from cost savings, why governments are supporting or developing health websites is because often information is not reviewed by experts and is therefore of poor quality (Zeng et al. 2004). The Australian government acknowledged this when establishing the HealthInsite portal: “HealthInsite addresses two major deficiencies associated with the increasing tendency of Australian health consumers to source information from the Internet: finding relevant material, and quality assurance” (NIHIMA 2001). Little research however has been undertaken in investigating the effectiveness of delivering health information via health websites.

The following excerpt from the Executive Director of Health On the Net Foundation highlights some of the issues relating to Internet based health information:

“... to make a reasonable decision about what health information they will trust, or what products or services they will use, individuals need to know what standards a site employs in developing content. Health-related websites must make clear the sources which they have used and ensure that the information presented is appropriate, independent and timely. Health-related websites should also identify who is most likely to visit the site and ensure that the information presented is as comprehensible and as easily accessible as possible to all visitors including disabled persons. As some sites may be sponsored by one party and hosted by a different one, these relationships should be clearly disclosed on the site” (Boyer 2006)

Through our previous research we have identified the features and functionality of health websites, which could address the deficiencies of the current approaches to health information provision (Moon and Burstein 2005). Our research suggests that effective health information websites must be seen to be delivering quality information, have some level of intelligence to assist retrieval of relevant information, and be easy to use. Our results are based on usability testing of two official and one non official Australian health websites. We identified factors impacting on the users’ perception of quality and effectiveness of websites, and provide recommendations for designing more effective health information websites.

HEALTH INFORMATION WEB SITES

The literature highlights many issues in relation to health information websites. The three issues that were important for our research relate to the user’s perception of quality, the retrieval of information relevant to the individual and how easy a health information website is to use. A major problem identified with searching the Internet for health information is retrieving relevant accurate information, often information is inaccurate or even misleading (Fritch 2003; Childs 2004). We did not seek to evaluate the quality of the information provided through health websites, this is a very complex issue and there is significant literature on this issue (Huntington et al. 2003; Bomba 2005). Our concern was with how users identify and perceive quality of a health Website which for the average health consumer is very difficult (Childs 2004).

The perception of quality can be engendered in a number of ways. The HON Survey (2005) found that among health consumers “the domain name extensions enjoying the greatest credibility” included those from education or government organisations. Luo and Najdawi (2004) concluded that while information on quality is provided to health consumers, there is no consistency in the way this is done. Fritch (2003) proposes a taxonomy for health consumers to evaluate the quality of health information websites it includes; voluntary branding of websites to indicate standards, and to search only specific sites. For health consumers to be able to determine the quality of information is difficult particularly given that the quality of Internet content is largely a subjective concept. Acknowledging this, we argue that the user is actively engaged in the process of dynamically re-assessing the quality of the content based on their own context. Some websites provide a quality assessment, but do not state the criteria, hence, the user may not have the same level of confidence in the content's quality. For example, one quality indicator is the use of the HONcode© or Code of Conduct described as for “the provision of authoritative,
trustworthy Web-based medical information” (Health on the Net 2006). This is the most popular quality ‘seal’, the second most popular is ‘Trust-e’ (Luo and Najdawi 2004).

Frequently people do not find the Internet based health information useful (Vermaas and Wijngaert 2005). Information relevance is most important to health consumers (HON Survey 2006). The overwhelming quantity of information a user retrieves is a problem (Burstein et al. 2005). Therefore finding appropriate, relevant and timely information is often difficult (Childs 2004). Information is also often incomplete (HON 2006), and difficult to read (Silence et al, 2004). A ‘one size fits all’ approach to the delivery of health information is therefore not appropriate for the design of health information websites (Burstein et al. 2005).

A health website should provide functionality enabling health consumers to quickly and easily find relevant information. Luo and Najdawi (2004) note a number of features a health portal might have support searching such as "a catalogue of health information, a search engine, a personalization system, and a network of communities". They examined 12 websites for the presence or absence of these features. Four of the websites Luo and Najdawi (2004) investigated had all four features, the rest had either two or three. Other technologically possible features also exist such as some level of differentiation to improve searching, spellchecking, the use of ontologies to improve a user’s ability to find more relevant, timely information and reduce information overload.

Ease of use particularly the ability to find information is critical to the success of a health website (Huntington 2003; Williams et al. 2002). Childs’ (2004) study found that, in terms of design, users ranked ‘Easy to find information’ the second most important feature, the first was keeping personal details secure. Another major study of users retrieving health information reported that 37% of users were not able to find the health information they were looking for (Zeng et al. 2004). Among the factors that Zeng et al (2004) identified as to why information was not found were that the interface was confusing or the website was poorly organised. There are a number of other important usability aspects relating to website design which impact on ease of use, including text design, the display including the graphics, navigation and language (Fisher et al. 2004).

Kunst et al. (2002) suggest that the Internet has “the potential to facilitate but also to jeopardise health care provision”. The purpose of the research reported in this paper was to evaluate a number of health information websites, specifically examining the user's perception of quality, the features and functionality that contribute to information retrieval and relevance and ease of use.

RESEARCH DESIGN

As discussed earlier three aspects of health information website design were investigated through this research. The first stage of the research involved exploring her the technology available to website designers which had the potential to improve searching and retrieval of relevant information. Previous work by the authors established a number of features that are regarded as important for effective health information portals particularly in relation to the user's ability to search and retrieve relevant information (Moon J and Burstein 2005).

Three generic Australian health websites available to health consumers were assessed for the presence or absence of these features and functionality. As the research was conducted in Australia it was appropriate to use only Australian based websites. As noted by Childs (2004), health consumers face some difficulties when accessing information from websites in other countries. Other countries may have different health systems, different cultural practices and use different terminology.

A usability evaluation was conducted to assess the effectiveness from the health consumers perspective, of these three Australian health websites. Usability is defined as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.” (Bevan 2001). Cordes (2001) suggests "The fundamental goal of the evaluation is to identify usability problems with a product so developers can improve the product before real users encounter these problems". The usability evaluation specifically sought to explore the effectiveness of health websites from the user’s perspective. The usability instrument was based on an instrument developed and tested previously by one of the authors (Fisher et al. 2004)

Sixty eight users participated in evaluating each of the health websites resulting in 207 usable evaluations. The users were all third-year undergraduate tertiary students studying Human Computer Interaction. The users were of different age groups although the majority were under 25 years of age, 32% were female and 68% male. The users had a high level of Internet experience with 91% describing themselves as very experienced. Abdinour-
Helm et al. (2005) argue that students can be appropriate providing they are similar to Web users generally and likely to perform the tasks on the website being investigated. Users were asked if they had previously searched for health information on the Internet and more than half said they had. The use of students for usability studies such as this is in line with other studies (Nel et al. 1999; Zhang et al. 2000).

To ensure the relevance of the task to all users only health information sites that were non specific, i.e., generic in terms of the health information were selected, that is sites specific to a disease or a particular segment of the Australian population were excluded. In line with the findings of the HON Survey (2005) where 79% of health consumers indicated they preferred a government agency to be responsible for online health information provision only ‘official’ health websites, that is those supported by a government agency, were included. Only two Australian websites met the criteria; HealthInsite (www.healthinsite.gov.au) and Better Health (www.betterhealth.vic.gov.au). A third website, Health Network (http://www.healthnetwork.com.au/) was included on the grounds that although it was not a government sponsored website, it was not a commercial health website either.

The users were asked to “Think of a health issue that is important to you, a friend or a family member. Using this health website search for information on that topic”. Once the search was completed users filled out the questionnaire and reviewed the next site. The questionnaire required both qualitative and quantitative responses from the users and explored the user’s experience and views of that site.

RESULTS

User’s perceptions of quality

Each website was examined to see if there was reference to either the HONcode© or Trust-e. It can also be argued that the quality of a health website is in part determined by those who manage or sponsor the website. The websites selected, as mentioned were websites where the body responsible for the website was a government body and therefore regarded as reliable or a non commercial site. The front page of each website was examined, links to other information such as ‘About us’ and the footer were explored to establish if a website had statements about quality. Only one Australian health website, HealthInsite made reference to the HONcode© seal.

Qualitative comments from the users confirmed the importance of providing information on the sponsoring organisation of the website, information on quality and currency. Comments illustrating these points include:
- Lack of quality
- I believe its content is good, it’s approved by the government
- Can't tell if it is a reliable source
- Not update date, hard to trust the quality
- It's good to see they have a quality assurance page
- It was reliable and the articles I read were informative

Analysis of the presence/absence of functionality and features to improve information retrieval

Functionality and features such as those described are important in helping users effectively search and retrieve relevant information. Each of the three websites were examined for the presence or absence of specific features and functionality. The findings and how each feature or functionality may help the health consumer are presented next.

- PUSH and PULL features (search and browse): PUSH features relate to what kind of information is to be distributed and who should receive it. Features such as portal chats, forums, FAQ, and other online communication, are a form of PUSH feature. They ensure information provided to health consumers is up-to-date and helps in identifying if it is information the user has previously retrieved. PULL features relate to active searching.
- Personalization/Categorization of information: help users identify relevant information more quickly, reducing the quantity of information retrieved and can enable individual consumers to be targeted (Luo and Najdawi 2004). Personalization features of health websites could include information retrieved based on gender, patient/Doctor information, age.
Differentiation of the types of information: Not all users want information in the same format, for often health consumers prefer information written in layperson terms (Childs 2004). Differentiation can be provided for example based on specific diseases, a list of drugs in alphabetical order and providing categories such as patient stories, medical services, medical research for example http://www.mayoclinic.org/.

Spell checking and ‘sounds like’ indexing: Users frequently misspell medical terms impeding effective searching.

Parsing: Users who are unfamiliar with medical terminology may have difficulty phrasing appropriate questions hindering the retrieval of relevant information (Williams et al 2002). Parsing helps with that.

Ontology and Thesaurus: An Ontology or thesaurus helps users with unfamiliar words and phrases.

Metadata: provides structured information about the content based on some pre-defined schema. A number of commonly accepted metadata-scheme are used for improving information storage and discovery, ie Dublin Core.

These functionality/features definition and research results are summarised in the following table.

<table>
<thead>
<tr>
<th>Feature/functionality</th>
<th>Presence/absence assessed by</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PUSH</strong> and <strong>PULL</strong></td>
<td>Checked if the portal incorporates PUSH and PULL features.</td>
<td>BetterHealth provides a monthly e-mail newsletter and a facility for users to post questions which are later answered by an expert and maybe presented grouped under relevant topics as fact sheets. HealthInsite offers health consumers the option of saving their personal profile with previous search results and areas of interest. When topics are added to the website, users who have nominated interest in that topic will be notified via e-mail. All three websites have a Search function and allow users to browse content related to a topic area, including websites authored by a third party.</td>
</tr>
<tr>
<td><strong>Personalization</strong></td>
<td>Does the portal help to retrieve information relevant to the user? Eg did the portal start an initial dialog to identify user’s personal needs?</td>
<td>BetterHealth provided limited personalization through topics such as Men’s health, Pregnancy and birth. HealthInsite provided some personalization through their search function. Users could specify who the information was for i.e child or adult, and the type of information required to Health Network only provided searching through an option based on gender.</td>
</tr>
<tr>
<td><strong>Differentiated Information access</strong></td>
<td>Analysis of the differentiation of the types of information offered. For example was there medical, personal, supportive information offered?</td>
<td>BetterHealth provides personal stories, medical guides and health News. There are also a number of fact sheets available organised according to specified categories. HealthInsite provides information in a number of categories including conditions and diseases, health and well-being, fitness, nutrition etc and the option of searching for personal stories. Health Network provided no such features.</td>
</tr>
<tr>
<td><strong>Search engine</strong></td>
<td>Identify the search engine. For example was the search engine internal or external?</td>
<td>All websites provided a search function.</td>
</tr>
<tr>
<td><strong>Spell check and “Sounds like index</strong></td>
<td>Spell checking and ‘sound like’ indexing tested using misspelt words.</td>
<td>Websites using Google as the search engine have spell checking as an internal function. None of the Australian websites use Google and none offered any spell checking or options when a misspelt word was entered.</td>
</tr>
<tr>
<td><strong>Parsing</strong></td>
<td>The sentence &quot;I want to buy tamoxifen&quot; was entered into each website.</td>
<td>Two of the websites were not able to search on a sentence. HealthInsite provided three links relating to tamoxifen, however when tamoxifen itself was searched there were 49 options retrieved.</td>
</tr>
<tr>
<td><strong>Ontology and Thesaurus</strong></td>
<td>Checked for an ontology and thesaurus.</td>
<td>Better Health offers access to categorized fact sheets. HealthInsite lists health topics in alphabetical order, however, there are no links between related topics. Health Network provides a limited list of categorized topics but we have no link.</td>
</tr>
</tbody>
</table>
An examination of source code was made to establish if metadata was used. Better Health and HealthInsite use the AGLS metadata schema (Australian Government Locator Schema). HealthInsite contains a full description of the publishing policy standards including the details of how the metadata should be assigned to the content pages. Health Network has only limited use of metadata.

Including these features and functionality can improve the overall effectiveness of health websites. Given that the websites explored provided a very little by way of such features and functionality it is not surprising that users in their qualitative comments users indicated they had difficulties particularly with spelling medical terms and finding relevant information. Comments illustrating this include:

- Exact information required was not found
- Didn’t have information, not even a definition for my searched topic
- The information was very brief. But it was hard to find any more information on the topic
- I couldn’t spell Chlamydia
- First used search option which proved to be confusing.
- No index or A-Z list. Search didn’t mention if any or zero results were found
- There were only links to topics associated with issue, a brief summary or sentence regarding the article would’ve been nice

**Ease of use**

The usability test explored users’ reactions to the websites, their perception of quality and how easily they were able to locate relevant information. Table 2 presents the results of questions requiring a Yes/No response.

<table>
<thead>
<tr>
<th>Question</th>
<th>Total Yes</th>
<th>Total No</th>
<th>Health Insite</th>
<th>Better Health</th>
<th>Health Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were you able to find information on the topic you wanted information on?</td>
<td>155</td>
<td>48</td>
<td>Yes 79% No 21%</td>
<td>Yes 83% No 17%</td>
<td>Yes 63% No 37%</td>
</tr>
<tr>
<td>Was enough information on the topic provided?</td>
<td>135</td>
<td>66</td>
<td>Yes 74% No 26%</td>
<td>Yes 78% No 22%</td>
<td>Yes 51% No 49%</td>
</tr>
<tr>
<td>Would you use this website again to search for other health information?</td>
<td>131</td>
<td>70</td>
<td>Yes 59% No 41%</td>
<td>Yes 81% No 19%</td>
<td>Yes 56% No 44%</td>
</tr>
<tr>
<td>Did you trust the information provided on the website?</td>
<td>165</td>
<td>34</td>
<td>Yes 88% No 12%</td>
<td>Yes 94% No 6%</td>
<td>Yes 68% No 33%</td>
</tr>
<tr>
<td>Were you at any stage frustrated using the site?</td>
<td>52</td>
<td>144</td>
<td>Yes 33% No 67%</td>
<td>Yes 17% No 83%</td>
<td>Yes 30% No 70%</td>
</tr>
<tr>
<td>Were there any aspects of the website that caused confusion or slowed down your retrieval of information?</td>
<td>64</td>
<td>135</td>
<td>Yes 22% No 46%</td>
<td>Yes 30% No 70%</td>
<td>Yes 21% No 44%</td>
</tr>
<tr>
<td>Was there anything else you wanted to know but could not find out from the site?</td>
<td>55</td>
<td>144</td>
<td>Yes 19% No 81%</td>
<td>Yes 17% No 83%</td>
<td>Yes 47% No 53%</td>
</tr>
</tbody>
</table>

Table 2 indicates that 24% of users were unable to find information on the topic they were searching for, a third (33%) were not satisfied with the amount of information they found, and 35% would not return to the websites.

Table 3 presents the results of Likert scale type statements (5 point scale used where 1 was strongly disagree to 5 strongly agree) and one question. The question required users to answer on a 5 point scale (1 totally disinterested in the website to 5 totally engaged with the website).
Table 3 Overview of users’ responses to scale questions and statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Health Insite</th>
<th>Better Health</th>
<th>Health Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall how would you describe your experience using this site?</td>
<td>3.06</td>
<td>2.93</td>
<td>3.42</td>
<td>2.83</td>
</tr>
<tr>
<td>It was easy to navigate through the site</td>
<td>3.75</td>
<td>3.43</td>
<td>4.09</td>
<td>3.7</td>
</tr>
<tr>
<td>The site was easy to use</td>
<td>3.83</td>
<td>3.6</td>
<td>4.03</td>
<td>3.9</td>
</tr>
<tr>
<td>The language used was easy to understand</td>
<td>3.92</td>
<td>3.8</td>
<td>3.9</td>
<td>4.0</td>
</tr>
<tr>
<td>The design of the interface is appealing</td>
<td>3.34</td>
<td>3.2</td>
<td>3.6</td>
<td>3.2</td>
</tr>
<tr>
<td>The graphics on the site were appealing</td>
<td>3.11</td>
<td>3.1</td>
<td>3.4</td>
<td>2.8</td>
</tr>
<tr>
<td>The size of the text was easy to read</td>
<td>3.78</td>
<td>3.64</td>
<td>3.94</td>
<td>3.76</td>
</tr>
<tr>
<td>The text was displayed in a way that was easy to read</td>
<td>3.83</td>
<td>3.62</td>
<td>4.09</td>
<td>3.79</td>
</tr>
<tr>
<td>All the information I required was on the web site</td>
<td>3.15</td>
<td>3.2</td>
<td>3.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Number of steps required to get to the information was acceptable</td>
<td>3.44</td>
<td>3.0</td>
<td>3.7</td>
<td>3.5</td>
</tr>
<tr>
<td>It was easy to find information on the topic that was relevant for me</td>
<td>3.42</td>
<td>3.3</td>
<td>3.8</td>
<td>3.2</td>
</tr>
<tr>
<td>I understood the terminology used on the website</td>
<td>3.84</td>
<td>3.9</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>I felt confident about the reliability and quality of the information provided</td>
<td>3.69</td>
<td>3.8</td>
<td>4.0</td>
<td>3.2</td>
</tr>
</tbody>
</table>

The statement relating to the confidence users had in the reliability and quality of the information, suggests users preferred HealthInsite site, and BetterHealth over the HealthNetwork site. If we assume that a score of 3.5 indicates a positive result then navigation, ease of use, and text display were rated highly by the users. Overall users were not engaged with the websites, did not like the graphics or find the interfaces appealing and did not find all the information they wanted. Of the 12 items investigated, BetterHealth scored 3.9 or higher on six of these items.

Cross Tabulations

The quantitative data were analysed using SPSS. Cross tabulations were conducted using the question and statements presented in Table 3. Cross tabulations were used to establish those factors that impacted on users’ perception of information quality, finding relevant information and ease of use. A cross tabulation is used to demonstrate “the presence or absence of a relationship” (Bryman and Cramer, 1992, p.153). A chi-squared test was applied to determine the significance of the results and to establish the strength of the relationship; Pearson's $r$ was used. Pearson’s $r$ is a measure of a linear association between the variables although there is no definitive ‘rule’ with regard to interpreting the results (Bryman and Cramer 1992). Only the results of the statistically highly significant cross tabulations ($p< 0.001$) are presented. Based on a data set of 207, a weak correlation is assessed as one where $r$ is between 0.30 and 0.40 and a strong correlation where $r$ is greater than 0.40.

- Confidence in the reliability and quality of the information provided was influenced by:
  - if users found all the information they required ($r=.569$)
  - if users were engaged with the site ($r=.513$)
  - if the users found information that was relevant to them ($r=.492$)
  - if the number of steps needed to retrieve the information was acceptable to the users ($r=.346$)
  - if the users understood the terminology ($r=.329$)
  - if the users found the site easy to use ($r=.321$)
- Elements that influenced users finding relevant information included:
  - how easy a website was to use ($r=.436$)
  - how easy a website was to navigate ($r=.384$)
  - how well users understood the terminology used on the website ($r=.312$)
- The factors that impacted on how easy a website was to use included:
  - the number of steps needed to retrieve the information was acceptable to the users ($r=.515$)
  - the appropriateness of the text display ($r=.438$)
  - finding information easily ($r=.436$)
  - the appropriateness of the size of the text ($r=.357$)
  - finding all the information required ($r=.348$)
  - users finding the interface appealing ($r=.303$)
  - the users understanding the terminology ($r=.301$)
Users comments also included how easy they found the site to use. The major problems users encountered included the way the text was presented particularly font size being too small, confusion with the layout and the design and difficulties with navigation. For example:

- The font is too small to read. Too much information in one page
- Bad layout. Links too confusing
- Kind of confusing- especially the layout with different 'search results' on the bottom
- The links were small, so that led to mistakes clicking on them
- Contrast between text sometimes makes text difficult to read
- No pictures - visually unappealing

**DISCUSSION**

Our research began with a review of the technology available which when implemented, should improve the user's ability to find relevant information. We identified eight features or functionalities for improving health information retrieval. We established that few websites make use of such features and based on the users comments we can argue this does have an impact on the health consumer’s experience and satisfaction with their searching and retrieval of relevant information. The rest of the discussion is organised around the three elements of health websites explored through this research.

**Users’ perceptions of quality or trust**

For health consumers assessing website quality would have been very difficult. Users need information on how quality is determined or be guided based on some criteria, to do it themselves. HealthInsite was the only website in the usability study with the HONcode© seal but it did not rate as highly as BetterHealth in terms of users’ perceptions of quality. This suggests that such seals are not enough to instil confidence in the users with most users probably unaware of their significance.

A user’s perception of quality is also an important measure. Most users rated two of the Australian websites well in this respect. Users indicated general confidence in the reliability and quality of the information on both these sites. HealthNetwork rated poorly. This is consistent with the results of the HON Survey (2005) where health consumers indicated domain names with a ‘.com’ extension are regarded as the least credible when it comes to health. When tested with cross tabulations it is not surprising that where users were confident about the reliability and quality of a website they were more likely to return to that site and were more engaged with the website. The cross tabulations suggest that factors such as retrieval of particularly relevant information and how easy the site is to use also influence whether a user's perception of website reliability and quality. This was supported by the qualitative responses from users.

**Improving information retrieval and relevance through features and functionality**

Features and functionality offered on health websites are designed primarily to help users find relevant information easily. Despite the fact that the technology is available, these health websites offer very little. The qualitative responses also indicate that problems with spellchecking, not being familiar with medical terms and poor search functions resulted in user frustration. Although the three websites explored had a search function, the usability testing results indicate the search functions were often inadequate. Parsing, ‘sounds like’, ontologies and a thesaurus are features which assist with searching however only one site offered one of these features, parsing. Personalisation and differentiation help users identify information that is relevant to them. BetterHealth and HealthInsite offered some personalised features and different information access allowing users to ‘drill down’ further to help identify more relevant information. As reported in Table 2, users of these two sites indicated they were able to find more information than users of Health Network.

The usability study identified a number of factors that impacted on the user's ability to find relevant information. The most important factor was how much information the user was able to find. Websites that are easy to use and easy to navigate resulting more information being retrieved. It is not surprising that the two websites BetterHealth and HealthInsite, which offered users some help with searching, both rated more highly than HealthNetwork which had very little by way of features or functionality and only offered opportunity to browse information about a limited list of topics or search for terms, not categorised or personalised in any way.
Ease of use

Website usability is critical to success. Given the high number of users searching the Internet for health information, the importance of usability cannot be underestimated. Usability, as this research indicates, has an impact on other aspects including the level of confidence users have in a website.

The research indicated that Australian health websites generally were easy to use, the language was easy to understand, and the text was designed appropriately. However, it should be of concern that in the case of two of the websites more than 40% of the users said they would not use the site again. Improvements need to be made in the area of interface design as indicated in the qualitative responses. More attention needs to be paid particularly to how appealing the interface and graphics are, text size, and improved information retrieval mechanisms particularly how many steps it takes to retrieve information.

A closer examination of the individual websites further supports these findings. The website least preferred by the users was HealthNetwork, the one non-government sponsored website. HealthNetwork rated poorly in terms of the users’ confidence in the reliability and quality of the information, finding sufficient relevant information, and users expressed a high level of frustration.

DEVELOPING EFFECTIVE HEALTH INFORMATION WEBSITES

Although there has been significant research in the area of information quality and Internet-based health information, little has examined the delivery of health information from the perspective of website design. Table 4 presents the three elements investigated, and the recommendations for designing the factors that contribute to the effectiveness of each of these elements.

Table 4 Factors in developing effective health information website

<table>
<thead>
<tr>
<th>Impact factors</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The user’s perception of quality</td>
<td>Ensure information is relevant to the user</td>
</tr>
<tr>
<td></td>
<td>Ensure the website is easy to use and is engaging</td>
</tr>
<tr>
<td></td>
<td>Review terminology and ensure it is appropriate for the user</td>
</tr>
<tr>
<td></td>
<td>Information searches should be able to be completed in a minimum number of steps.</td>
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<tr>
<td>Information retrieval</td>
<td>Include push and pull functionality to improve information retrieval</td>
</tr>
<tr>
<td></td>
<td>Provide spellchecking, sounds like indexing, parsing ontologies and thesaurus to improve searching</td>
</tr>
<tr>
<td></td>
<td>Provide personalisation / differentiation to improve information relevance</td>
</tr>
<tr>
<td>Ease of use</td>
<td>Limit the number of steps needed to complete the task</td>
</tr>
<tr>
<td></td>
<td>Ensure the design of the text and presentation is appropriate and the graphics are appealing</td>
</tr>
<tr>
<td></td>
<td>Terminology must be appropriate</td>
</tr>
</tbody>
</table>

The authors acknowledge there are many other factors that impact on the effectiveness of a health website including who develops and maintains such websites. However, this research focused on just three elements. Other limitations of this research include the use of students. Further research is being undertaken which specifically explores the value a user places on the different features and functionality we have identified. We hope through this research to understand what is needed for building better health information websites.

References


