

A perspective on healthcare related web interfaces

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Abstract:

Consumer retrieval of health information through the internet has become prevalent. In the past, physicians provided filtered health information to the consumer. However, the availability of health related information including disease specific research trends over the World Wide Web is useful for clinicians and consumers. The use of internet based health care information by clinicians and consumers have increased in recent years. Nonetheless, consumers often have difficulties in evaluating such data in a comprehensive manner. Here, we describe the current status of health care related data over the World Wide Web.

Keywords: healthcare websites; symptom checker; disease description; navigability; user friendly; clinical decision support system

Background:

Websites which impart information pertaining to health should be designed keeping the user in mind. User-focused sites must not only be designed with good utility and usability, but must also address the functional literacy of the general population. This involves ensuring that the website text and cognitive artifacts such as graphs are not only readable, but understandable at a level that enhances the decision making of the consumers¹. The major goal in the development of usable web interfaces is to design interfaces that match user capabilities. Along with the user analysis, the analysis of the environment specifies the conditions in which the site is used. Several aspects of the physical environment are important for the design of the interface. The place and conditions in which the interface is used can be a deciding determinant for the type of interaction the user has with the interface. Websites are accessed all around the world therefore social and cultural issues are an integral part of the analysis. The social environment of the users can impact the success or failure of a website [1]. The assessment of functions and overall navigation of the site is also very important. The content and visual criteria used into the functional analysis help to identify the structure of the website. The hereby reported comparative analysis of the various healthcare interfaces, examines different aspects of similar websites and their applications on the World Wide Web. It compares the various websites in terms of functionality, navigation, usability aspects of the interface screens, and user platforms. It assists in defining alternative representations, and can provide design ideas and determine efficacy of similar existing applications or websites [2].

There are various health related websites so that user can find comprehensible and reliable information pertaining to health issues. The commonly used databases have been summarized in **Table 1 (see supplementary material)**. The website wrongly diagnosis [3] contains information regarding commonly occurring diseases, their symptoms and signs, differential diagnosis, causes, diagnostic tools, treatment and associated research work and available statistics. 'Symptom checker' enlists the causes of a particular symptom and a combination of symptoms thus narrowing down the search to few limited causes of that disease. It is associated with a description of those diseases and their suggested treatment. There is a questionnaire in 'Diagnosis checklist' for the time, location, pattern and duration of a particular symptom. It elicits any relevant past history, personal history, family history, treatment history and suggests a plausible diagnosis. Health guidance relevant to specific age groups (pediatric and geriatric age groups) and system wise discussion of symptoms (Cardiovascular, Respiratory and Gastrointestinal tract etc) has been covered.

'Disease centre' discusses details of some most commonly occurring diseases and some rather rare diseases. The website also contains information on Top 100 misdiagnosed diseases. There are numerous medical conditions that are overlooked in diagnosis, misdiagnosed as another disease or diagnosed too often. Certain conditions are over diagnosed or under diagnosed-delayed, missed, underlying disease are missed, disease complications are missed or wrong subtype of disease is diagnosed. This website looks into those subtle differences, evaluates the most common misdiagnosed condition and prompts the key features which help to differentiate them from the correct diagnosis. This can be of value to the clinician when faced with a confusing set of differential diagnosis of a particular disease and also of value to the patient to realize these subtle differences and give a more accurate history or cooperation in the examination so that the practitioner can arrive to a more conclusive and accurate diagnosis.

In medicinenet [4] there is an alphabetical list (A to Z) of disease condition. There is an alphabetical list of signs and symptoms, procedures and tests (when are they performed and what do they signify) and medications (uses, how to use, dosage, route of administration, side effects and contraindications). There is also a feature on medical news, health and living and medical dictionary. Then there are websites pertaining to specific diseases like ArthritisInsight [5]. This gives easy to read factual information on osteoarthritis, rheumatoid arthritis, fibromyalgia, gout and other types of arthritis. There are around 1000 pages of information. In addition one can find lots of support from other patients with arthritis, tips for better living and the latest arthritis news. There is a website on Cystic Fibrosis [6]. Cystic fibrosis mainly affects the Caucasian population. This is a website mainly focused on its symptoms, foundations, pictures and treatment therapies. Alternative therapies, news article, research and latest developments in the field of cystic fibrosis are also available.

Health related websites can apprise the patients of information related to disease or how to keep good health. It can also help to improve General Practitioners use of the internet for the purposes of gathering valid and clinically useful medical information depending upon his/her information management skills, search skills, structuring clinical questions, navigating through a selection of reputable clinical databases, and case studies. If trained properly, significant differences can be found in GPs' knowledge about pre-appraised evidence-based medicine resources, frequency of use of the internet for clinical purposes, search skills and confidence, and perceived competence in using clinical databases. Qualitative data have indicated that GPs are

more likely to put the training into practice outside consultation times (rather than during consultation) as clinical searches take too long and can detract from doctor/patient rapport. GPs reported that they mainly use the internet to perform occasional quick searches for unfamiliar medications or illnesses.

The internet can also help keep GPs up to date with new findings. Traditional approaches of continuing medical education (e.g. attendance at educational meetings) are based on the assumption that something learned now can be applied in practice in the future (so-called 'just in case' learning). An alternative approach, which is facilitated by the use of the internet, is to solve clinical queries as they arise in practice, possibly while the patient is still present. This on-the-job method has been called 'just in time' learning [7]. Health related websites thus benefit both the patient and clinician alike. The whole focus is to make these sites more informative, more authentic and more comprehensible to the user. The websites can provide a better clinical decision support so that the user can have a detailed and easy access to health information and thus

can deal and live with his/her disease condition in a better way. Also the goal is to develop web servers from where the patient can upload or access his health records. He can get a computer generated opinion or his health information is transmitted to a healthcare specialist at a far off location to get his opinion. The goal is to identify how to build health related systems that help consumers who wish to understand and contemplate their health records and information and integrating them with an overall program of IT for consumer empowerment.

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Supplementary material:

Table 1: Comparison of some of the medical related websites dealing with multiple diseases

1	URL	www.MedicineNet.com	www.WrongDiagnosis.com	www.RxList.com
2	Rank	116	468	380
3	Estimated monthly Traffic by US people	8.2 Million	3.0 Million	3.6 Million
4	Features			
	Alphabetical list of Disease conditions	Available	Not Available	Available
5	Alphabetical list of Procedures and Tests	Available	Not Available	Not Available
6	Alphabetical list of Medications	Available	Not Available	Available
7	Disease descriptions	Available	Available	Available
8	Causes of individual and combination of symptoms	Not Available	Available	Not Available
9	Information on most commonly misdiagnosed diseases	Not Available	Available This website looks into those subtle differences, evaluates the most common misdiagnosed condition and prompts the key features which help to differentiate them from the correct diagnosis	Not Available
10	New drugs and recent updates	Not Available	Not Available	Available
11	Drug dosage ,its route of administration, side effects and drug interactions	Not Available	Not Available	Available
12	Medical Dictionary	Available	Not Available	Available