Education and Consumer Informatics

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Summary

Objectives: This article presents the 2009 selection of the best papers presenting the advancements in the field of Education and Consumer Informatics with emphasis on quality online health information and its uses in the medical field.

Method: Synopsis of the articles selected for the IMIA yearbook 2009

Results: Six papers from international peer reviewed journals where selected for this section.

Conclusion: The selection of articles gives an overview of the currently growing need for quality online health information and demonstrates the integration of online health information in medical care as well as the importance of continuing education through online training programs.

Keywords

Quality online information, criteria, training, education, online information

Introduction

The need for health information has been steadily growing over the past few decades with a greater population of educated and informed patients who seek an active role in their healthcare. However, this need was not adequately met until the advent of the Internet which revolutionized not only health but all domains and their information provision.

Although the Internet is indeed a valuable instrument for information sharing, it has several drawbacks, the main one being the non-regulation of quality. There is a growing number of health information sources on the Web with a highly variable degree of quality.

The role of eHealth in consumers and education was recognized globally at the fifty-eight World Health Assembly where all members' states adopted the eHealth resolution in 2005. The need for quality standardization of online health information has also been recognized [1]. The need for quality regulation was also identified by the European Commission which proposed the Quality Criteria for Health related Websites, adopted in 2002 [2] and was actually implemented by the French government through the collaboration of the High Authority of Health [3] and the Health On the Net Foundation, a third party certification body.

About the Paper Selection

The papers selected discuss the uses of online health information in various contexts of health care with emphasis on the quality of the health information. The first paper [4] presents the use of an online evidence system by a group of general practitioners in a 12 month period and the trend seen in usage. The second paper [5] compares the results obtained from a number of evaluation instruments which are used to evaluate the health information and its quality. Out of several such instruments used, it is interesting to note that DISCERN, HONcode, and NCCAM were the most cited. The third paper [6] describes the use of Google search results on influenza-like illnesses in a population, as a method for early detection to be used to supplement traditional surveillance methods. The next paper [7] presents Internet-based learning by health professionals via various methods, where the results showed that Internet-based learning had consistently better results compared to no learning. The fifth study [8] is an interesting pilot study about the ability of non-physicians to reach a diagnosis using the Internet as an information resource. The conclusion reached was that patients could take an active part in their health care with the aid of online health information. However even so, only one of five diagnoses done by non-physicians were correct, concluding that a patient cannot acquire the knowledge of a medical professional through online information. The last [9] paper describes a study evaluating the ability of the Internet to provide reliable and non-biased information about colorectal cancer.

Conclusions and Outlook

While the Internet has been increasingly well known over the past 20 years as a growingly important source of information, that its potential was realized

only recently, along with concerns for information quality emerged.

These articles demonstrate the growing need for quality standardization of online health information and possible measures to meet this need.

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9. Sajid MS, Iftikhar M, Monteiro RS, Miles AFW, Woods WGA, Baig MK. Internet information on colorectal cancer: commercialization and lack of quality control. Colorectal Dis 2008 May;10(4):352-6.

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Appendix: Content Summaries of Selected Best Papers for the IMIA Yearbook 2008, Section Education and Consumer Informatics*

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* The complete papers can be accessed in the Yearbook's full electronic version, provided that permission has been granted by the copyright holder(s)

Table 1 Best paper selection of articles for the IMIA Yearbook of Medical Informatics 2009 in the section 'Education and Consumer Informatics'. The articles are listed in alphabetical order of the first author's surname.

Section
Education and Consumer Informatics
▪ Breckons M, Jones R, Morris J, Richardson J. What do evaluation instruments tell us about the quality of complementary medicine information on the internet? J Med Internet Res 2008 Jan 22;10(1):e3.
▪ Cook DA, Levinson AJ, Garside S, Dupras DM, Erwin PJ, Montori VM. Internet-based learning in the health professions: a meta-analysis. JAMA 2008 Sep 10;300(10):1181-96.
▪ Ginsberg J, Mohebbi MH, Patel RS, Brammer L, Smolinski MS, Brilliant L. Detecting influenza epidemics using search engine query data. Nature 2009 Feb 19;457(7232):1012-4.
▪ Magrabi F, Westbrook JI, Kidd MR, Day RO, Coiera E. Long-term patterns of online evidence retrieval use in general practice: a 12-month study. J Med Internet Res 2008 Mar 19;10(1):e6.
▪ Sajid MS, Iftikhar M, Monteiro RS, Miles AF, Woods WG, Baig MK. Internet information on colorectal cancer: commercialization and lack of quality control. Colorectal Dis 2008 May;10(4):352-6.
▪ Siempos II, Spanos A, Issaris EA, Rafailidis PI, Falagas ME. Non-physicians may reach correct diagnoses by using Google: a pilot study. Swiss Med Wkly 2008 Dec 13;138(49-50):741-5.

Magrabi F, Westbrook JI, Kidd MR, Day RO, Coiera E

Long-Term Patterns of Online Evidence Retrieval Use in General Practice: A 12-Month Study

J Med Internet Res 2008;10(1):e6

This paper describes a study done amongst Australian General Practitioners (GPs) to evaluate the long-term use of an online evidence system in routine clinical practice.

The prospective cohort study, performed on 59 GPs who were provided with an online evidence system specifically designed around the needs of general practitioners was conducted for a period of one year.

71% of GPs were male and between 35-54 years and 88% reported their computer skills as 'good' to 'excellent'.

Results showed a total of 2'543 searches were done by the participants during the 12-month period and the total number of searches by each participant ranged between 1 and 240. The authors report that during the first two months, an average of 9.1 to 10.8 searches were made per GP, then dropped to 4.4 searches per GP in the third month and then stayed stable at 0.4 and 2.6 searches per GP per month for the rest of the study. On comparing the 'low search group' (GPs who used the system less than 10 times) with the 'high search group' (GPs who used the system more than 50 times), the main difference seen was that many of the 'low search group' consisted of participants who were 45 years and older, which could be a reflection of this group being less comfortable with online searching. In conclusion, the authors state that judging from this study, the current long-term frequencies of online evidence use by clinicians are likely to be low, and that overall uptake and integration into clinical practice require long-term studies.

Breckons M, Jones R, Morris J, Richardson R

What Do Evaluation Instruments Tell Us About the Quality of Complementary Medicine Information on the Internet?

J Med Internet Res 200810(1):e3

The study reviews available evaluation instruments and assesses their performance when used by a researcher to evaluate websites containing information on complementary medicine and breast cancer. Particular emphasis was placed on finding out if the instruments used the same criteria, agreed on the ranking of websites, were easy to use by a researcher, and if use of a single tool was sufficient to assess website quality.

The authors describe how 12 evaluation instruments were chosen out of the 39 selected earlier using certain inclusion criteria such as 'do the instruments use the same criteria, do they agree on ranking, ease of use' etc.. A sample of 12 websites was chosen using Google results on complementary medicine for breast cancer, where 6 sites were the first 6 results of Google and the other 6 were chosen according to their origin (charities, commercial etc). They were then evaluated using the 12 evaluation instruments. Each site was given a mark using the individual scoring system for each instrument, which was then converted to a percentage score. Sites were then ranked from 1 (best) to 12 (worst) based on these scores. The criteria used by the instruments were compared to the nine main criteria identified by the Health Improvement Institute and Consumer Reports WebWatch (HIICRW).

The 3 most cited instruments were DISCERN, HONcode, and NCCAM. Instruments varied in the criteria assessed and ease of use such as DISCERN seemed more difficult to apply than NCCAM and HONcode did not seem to agree with the rankings produced by other instruments. The authors conclude that, although instruments differed in the range of items assessed, there was fair agreement between most available instruments. Combining some of the better features of instruments to provide fewer, easy-to-use methods would be beneficial to gateway providers.

Ginsberg J, Mohebbi MH, Patel RS, Brammer L, Smolinski MS, Brilliant L
Detecting influenza epidemics using search engine query data
Nature 2009;457(7232):1012-4

The study presents a method of analysing large numbers of Google search queries made daily by the public, to track influenza-like illness in a population as a method of early detection of influenza epidemics. Traditional surveillance systems, including those used by the US Centers for Disease Control and Prevention (CDC) and the European Influenza Surveillance Scheme (EISS), rely on both virological and clinical data, including influenza-like illness (ILI) physician visits. The authors describe an automated system which tracked all influenza-related search queries for 5 years through a time series of weekly counts for influenza related search queries between 2003 and 2008 in the United States. 50 millions queries were tested and the automated query selection process produced a list of the highest scoring search queries. 45 queries were chosen which obtained the best fit against out-of-sample ILI data across the nine regions. Using ILI-related query fraction as the explanatory variable, a final linear model to weekly ILI percentages between 2003 and 2007 for all nine regions was put together, thus obtaining a single, region-independent coefficient. Throughout the 2007–08 influenza season, preliminary versions of the model were used to generate ILI estimates. Because search queries can be processed quickly, the resulting ILI estimates were consistently 1–2 weeks ahead of CDC ILI surveillance reports. Finally, the authors conclude that this system is not designed to be a replacement for traditional surveillance networks or the need for laboratory-based diagnoses and surveillance but might be useful in supplementing them.

Cook DA, Levinson AJ, Garside S, Dupras DM, Erwin PJ, Montori VM
Internet-Based Learning in the Health Professions
JAMA 2008 Sep10;300(10):1181-96

The study shows the effect of Internet-based instruction for health professions learners compared with no intervention, and with non-Internet interventions by identifying and summarizing all studies published on this topic. 2 systematic reviews of the literature with meta-analyses have been conducted.

The authors worked simultaneously and independently to examine full text articles published from 1990 to January 2008 for eligibility. Studies were rated according to defined criteria such as representativeness of the intervention group. The final number of selected published studies was 201, of which most of the teaching consisted of self-study or virtual patients tutorials. Another quarter required online discussion with peers, instructors, or both. Most of the studies had multiple choice questions' (MCQ) as assessment while a minority of the studies used other scoring methods. The authors demonstrated that Internet-based learning had a consistently positive result as compared to no intervention. However, the authors were not able to conclude on the advantage of the Internet-based learning compared to non-Internet format due to the inconsistency of the effects across studies.

These discrepancies, the authors state, could be due to differences in learning, instructional methods, and other aspects of the teaching process.

Siempos II, Spanos A, Issaris IA, Rafailidis PI, Falagas ME
Non-physicians may reach correct diagnoses by using Google: a pilot study
Swiss Med Wkly 2008 Dec13;138(49-50): 741-5

The authors describe a study of the ability of non-physicians to reach a diagnosis using the Internet. Four non-physicians, 2 women and 2 men, aged between 22 and 24 years independently searched 26 case studies following which, they used search terms to find the diagnosis of each case. The same was performed by four physicians, 2 men and 2 women, aged between 25 and 27 years. The diagnostic success of the four non-physicians was compared with that of the four physicians.

The diagnosis success rate for non-physicians was significantly low compared to physicians. However, the average success of the non-physicians was

22.1% with one obtaining 10 correct cases out of the 26 and the others 3 with 4, 4 and 5 correct cases each. The time taken for both non-physicians and physicians to read each case record was approximately the same at 8.9 ± 6.7 minutes. However, the time taken for non-physicians to search Google per case took 17.4 ± 7.9 minutes, while physicians took less time with an average of (13.6 ± 8.5 minutes). The authors conclude their findings show that patients may arrive to the medical office with a correct diagnosis by using the resources of the Internet, while the physician remains the central decision maker with regards to a patient's health.

Sajid MS, Iftikhar M, Monteiro RS, Miles AFW, Woods WGA, Baig MK

Internet information on colorectal cancer: commercialization and lack of quality control

Colorectal Dis 2008 May;10(4):352-6

The study assesses the ability of the Internet to provide information about Colorectal Cancer.

The authors used 6 search engines: Yahoo, Google, MSN search, Alta Vista, Excite and Lycos. The search term 'Colorectal Cancer' was entered into each search engine and the first 300 results for each were accessed. The links were then classified according to type, provider, target reader and commercial orientation.

Most of the links were commercial, related to modalities of managing the disease. Although most of the content was targeted to the general public, it was generally considered to be beyond the readability levels of the audience.

The authors also state that the level of quality varied extensively from evidence-based information on nlm.gov to non-referenced information about herbal treatments on commercial websites. In more than 95% of the articles, there was no reference listing.

They conclude that about half of the links on colorectal cancer are commercial which provide information on goods or private health services while less than 1% information is being provided by professional societies.

The authors finally state that from the results shown, it is obvious that consensus criteria have to be established to enable access to quality health information about colorectal cancer as there is a growing need for quality regulated information on this topic.