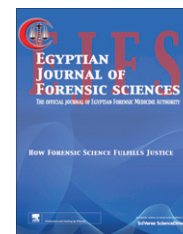Contents lists available at SciVerse ScienceDirect

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ORIGINAL ARTICLE

Evaluation of ethical and legal perspectives of physician–patient relationship on Arabic Health Websites

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Abstract *Introduction:* The internet is becoming an increasingly popular tool for health seekers. Research on health websites raises ethical debate about the quality of information on the Websites. This work aimed to evaluate Arabic Health Websites from ethical and legal perspectives and evaluate the physician–patient relationship on the web.

Methods: This is a descriptive study. A Google and Yahoo search for the term "Arabic Health Websites" in Arabic language was performed and 430 relevant websites were accessed. They were evaluated using a checklist designed by research team based on E-Health Code of Ethics, 2000 to evaluate candor, honesty, quality of information, privacy, informed consent and professionalism in online healthcare.

Results: Authors were mentioned in 21.4% of sample and 90% of sites did not mention when the information was last updated. It was noticed that 9.5% of sites mentioned collects data from users and whether data is shared with others or not. The limitations of consultation were mentioned in only 17.7%. The present study revealed that 42.5% of websites assured that healthcare providers obey the laws and regulations governing professional licensing and prescribing.

Conclusion: This study revealed poor coverage of most evaluated items.

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1. Introduction

The Internet has become and will continue to be a significant means by which individuals self-educate with respect to health, and this self-education has the potential to result in important changes in the dynamics of the physician-patient relationship.[1]

There are over 100,000 websites worldwide with varying quality of health information that is used by consumers and professionals.[2] Additionally, several hundred million people worldwide use the Internet.[3] In the Middle East, there are an estimated 33,510,500 Internet users and between 2000 and

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2007 the region witnessed an impressive Internet usage growth rate of 920.2%.[4]

Although use of the Internet continues to grow rapidly, its impact on healthcare is unclear. Health information on the Internet may make patients better informed, leading to better health outcomes, more appropriate use of health service resources, and a stronger physician–patient relationship. However, health information on the Internet may be misleading or misinterpreted, compromising health behaviors and health outcomes, or resulting in inappropriate requests for clinical interventions.[5]

Consumers access online health information in three primary ways: searching directly for health information, participating in support groups and consulting with health professionals.[6] The pervasiveness of the Internet and the World Wide Web in health and healthcare raises multiple concerns about privacy, confidentiality, quality assurance, professionalism, liability, and responsible medical practice.[7]

There are an increasing number of sites sponsored by physicians which provide information on virtually every medical condition. Usually these physicians' sites are described as being of two primary types: sites that offer generic medical and health information or sites that provide varying degrees of advice. If the information extends beyond generic information and becomes patient-specific, and if it involves diagnosis or specific advice, it seems reasonable for the user to assume that some semblance of a professional relationship exists.[8] Hence, a doctor is under the duty to exercise skill and care, independently of any contract for services, from the moment assumes responsibility for giving advice or treatment to a patient.[9]

Eighty percent of American Internet users have searched for health information online. They are called "health seekers". Three quarters of health seekers say they do not consistently check the source and date of the health information they find online. This translates to about 85 million Americans gathering health advice online without usually examining the quality indicators of the information they find. One possible reason for this diminishing diligence in checking sources and dates might lie with health websites themselves.[10]

Websites should be required to adhere to a strict code of ethical conduct.[11] The e-health space has responded to public concerns by creating multiple codes of ethics/conduct, guidelines, or principles for Web-based health activities.[12] Initiatives have been introduced in an attempt to improve the quality of Internet-based health information. One such control is the Health on the Net (HON) code. Similarly the "E-Health Code of Ethics" has been developed in an effort to respond to concerns regarding reliability of information, privacy, and confidentiality.[3,13]

As the internet can affect physician–patient relationship and change the way of practicing medicine, this study is carried out to evaluate the ethical and legal considerations of Arabic Health Websites providing health services in the form of medical consultation, health-related information and selling or advertising health products.

2. Methods

This is a cross sectional descriptive study where search engines "Google.com and Yahoo.com" were searched for Arabic Health Websites entering the term "Arabic Health Websites" in Arabic language. From the Google search 57 links and from Yahoo search 200 links were identified in the form of directories and forums containing health websites. Snowball sampling was used to locate other sites through those links.[40] Arabic Health Websites providing health services to the public in Arabic language in the form of medical consultation, health-related information, selling or advertising health products were included in this study. Four hundred and thirty relevant websites fulfilling the inclusion criteria were accessed. Websites having technical difficulties in the host server and advertising only sites without offering any educational material were excluded.

The tool used in this study was a checklist designed by research team. It was based on E-Health Code of Ethics, 2000[14] to evaluate the adherence of the Arabic Health Websites to the following criteria.

Candor (disclosure of information about ownership, sponsorship, supervisors on the site and purpose of the site); *Honesty* (distinguishing scientific information from information that promote, advertise or sell a health product or service); *Quality of information* (provide data about information providers, date, update and source of information, review process, base for information provided, presence of a quality seal, editorial policy, authority approval for health products or drugs); *Informed consent* (respect users' right to determine whether or how their personal data may be collected, used, or shared); *Privacy* (respect the obligation to protect users' privacy); *Professionalism in online healthcare* (provide information about medical advice providers, fees and limitations of online consultation).

A pilot study of 50 health websites was performed to test and refine the tool used in the study. Descriptive statistics of the study variables were described in terms of frequency and percentage.

3. Results

The ethical evaluation of 430 Arabic Health Websites showed that 85.3% of the websites disclosed the owner and only 25.8% mentioned who are the sponsors of the site and revealed the source of funding. The study also showed that only 52% of the websites disclosed clearly the purpose of the website. Supervisors on the site were mentioned in 40.2% of studied sites while their credentials were mentioned in only 38.6% of sites.

The present study showed that 70.5% of sites clearly distinguished contents intending to promote or sell a product or service from the scientific contents.

Results presented in Table 1 showed the frequency distribution of Arabic Health Websites fulfilling ethical criteria of Quality of information. It is important to mention that 21.4% of websites mentioned who provided the information in all articles and only 10% of the sites mentioned when the provided information was last updated.

The frequency distribution of Arabic Health Websites fulfilling ethical criteria of informed consent was summarized in Table 2. The present work showed that only 8.8% revealed how the sites will use the collected data while only 9.5% of the websites mentioned whether or not they share personal information with other organizations. It is important to men-

Table 1 Frequency distribution of Arabic Health Websites fulfilling ethical criteria of Quality of information.

Item	Frequency (N = 430)	%
• Mention the provider of medical information	158	36.7
• The previous is mentioned in all articles	92	21.4
• Mention the provider credentials	143	33.3
• The previous is mentioned in all articles	86	20
Mention the base for provided information	156	36.3
The language is easy and clear	378	87.9
Presentation of information is easy and simple for users	122	28.4
Ease of navigation	333	77.4
Independence of editorial policy	47	10.9
Evaluation of information provided	35	8.1
Websites accredited	18	4.2
• Mention the date for published information	128	29.8
• The previous is mentioned in all articles	117	27.2
• Mention when information were last reviewed	51	11.9
• The previous is mentioned for all articles	45	10.5
• Mention when information were last updated	48	11.2
• The previous is mentioned for all articles	43	10
• Mention the source website used with references	54	12.6
• The previous mentioned for all articles	17	4
States if the health products are approved by authorities	20/189[a]	10.6

[a] NP = 241 (websites not providing advertisement on drugs or health products).

Table 2 Frequency distribution of Arabic Health Websites fulfilling ethical criteria of Informed consent.

Item	Frequency (N = 430)	%
Collected data clear	39	9.1
Who collects data	41	9.5
How the site will use that data	38	8.8
Stating sharing data with others or not	41	9.5
Mention that it shares data with others	28/41	68.3
• Which organizations	19/28	67.9
• For what purposes	19/28	67.9
• What data does it share	19/28	67.9
Obtaining user's consent to collect, use or share personal data in the way described	35	8.1
Clarifying consequences may occur when a visitor refuses to provide the site with his data	28	6.5

tion that only 8.1% of sites obtained users' consent to collect, use or share personal data in the way described.

Data representing the frequency distribution of Arabic Health Websites fulfilling ethical criteria of Privacy was showed in Table 3. Only 8.8% of websites assured users that they prevent unauthorized access to personal data and 1.9% mentioned how they store personal data but only 0.5% of websites revealed for how long data is stored.

Table 3 Frequency distribution of Arabic Health Websites fulfilling ethical criteria of Privacy.

Item	Frequency (N = 430)	%
Preventing unauthorized access to personal data	38	8.8
Enabling users to review, update and correct personal data	19	4.4
Mention how it stores user's personal data	8	1.9
Mention for how long data is stored	2	0.5
Assures that personal data is de-identified and cannot be linked back to the user	13/379[a]	3.4

[a] 51 websites were excluded as they did not contain personal data about health that should be de-identified.

Table 4 Frequency distribution of Arabic Health Websites fulfilling ethical criteria of Professionalism in online healthcare.

Item	Frequency ($N = 367$)[a]	%
• Health seekers pays for online consultation	22[b]	6
• If yes, what fees and how payment will be charged	9/22	40.9
Assuring that healthcare providers obey laws and regulations of professional licensing and prescribing	156	42.5
Healthcare providers are identified	172	46.9
Mention the credentials of healthcare providers	161	43.9
Identifying where healthcare providers practice	143	39
Mention the limitation of consultation	65	17.7

[a] 367 health websites provide medical consultation.
[b] 22 health websites provide paid online consultation.

In Table 4, the frequency distribution of Arabic Health Websites fulfilling ethical criteria of Professionalism in online healthcare was summarized. The present study revealed that 42.5% of websites assured that healthcare providers obey the laws and regulations governing professional licensing and prescribing while only 17.7% of the websites mentioned the limitations of consultation.

4. Discussion

A number of tools have been developed for the assessment of website quality.[15,16] In the present study a tool based on E-Health Code of Ethics has been used. The goal of the E-Health Code of Ethics is to ensure that people worldwide can confidently and with full understanding of known risks realize the potential of the Internet in managing their own health and the health of those in their care.[14]

Eysenbach found that consumers assessing the credibility of a website primarily looked for the source, a professional design, a scientific or official touch, language, and ease of use. Study participants never checked any "about us" sections of websites, disclaimers, or disclosure statements.[17] A Consumer WebWatch (CWW) study of consumers reported findings similar to Eysenbach's: once people get to a site, they do not use rigorous criteria to assess the site's credibility. They almost never referred to a site's privacy policy. The average consumer paid far more attention to the superficial aspects of a site, such as visual cues, than to its content.[18]

In the present study it was noticed that the owners of the sites were mentioned in 85.3% of sites and sponsorship was acknowledged in only 25.8% of them. Also in this study, 40.2% of sites mentioned the supervisors on the site while their credentials were mentioned in only 38.6% of sites. However in a study conducted by Howitt et al. to evaluate general practice websites in UK, those who were responsible for the sites were mentioned in only 16.7% and the source of funding for sites was stated in only 4.8%[19] These results are in agreement with those recorded by Marriott et al. assessing the quality of websites providing information on infertility in UK who found that 35% of websites detailed who financed them.[20] Eysenbach et al. found that some quality criteria are consistently given (e.g., "ownership disclosure," with 99% of sites providing information).[21] In the study of Al-Huziah et al., they reported that 36.9% of Arabic Health Websites mentioned the source of funding.[22]

The present work showed that 70.5% of sites clearly distinguished between contents intending to promote or sell a product or service; this might reflect the good design of websites separating scientific content from advertisements or by the use of different style from that of the rest of the site. However, in the study conducted by Howitt et al., they found that in 90.8% of sites advertisements were not distinguishable from other content.[19] Al-Huziah et al. found that honesty in advertising was present in only 16.40% of sites. This difference might be due to the difference in search and sampling methods used in both studies. Also, due to the difference in the method used for the assessment of this feature; HON code used in the study of Al-Huziah et al. assesses advertising depending on both design and the presence of advertising policy. While in the present study, assessment depended on design only.[22]

Regarding the quality of information, the present work showed that 21.4% of websites mentioned who provided the information in all articles. The results are consistent with those reported by Marriott et al. finding that authors were mentioned in 25% of websites.[20] However, Al-Huziah et al. reported in their study that 59.8% were compliant with authoritative principle. This might be due to the fact that almost half of the websites in their study were represented by professional associations and also due to the difference in number of assessed sites between the present study and their study (430 vs. 122).[22]

This work also showed that 20% of websites mentioned the authors' credentials. Martins and Morse recorded that authors were mentioned in 37.5% of all websites. They also found that authors' credentials were stated in 57.5% of all sites.[23] These results are also in line with those recorded by Griffiths and Christensen evaluating health information on depression.[24]

Eysenbach et al. found that some quality criteria are not given (e.g., "credentials of physicians not disclosed in 97.5% of sites and 64% of Websites failed to provide a date of updates").[21]

Okamura et al. evaluated 197 fertility websites and reported that fewer than half of the websites satisfied one or more of the four accountability standards (authorship, attribution, disclosure and currency) and only 2% satisfied all four standards.[25]

In the present study, only 10% of the sites mentioned when the provided information was last updated in all articles of the site. It is worth mentioning that the source of information in all articles was mentioned in only 4% of sites. These results reflect the poor adherence of Arabic Health Websites to a rigorous evaluation system ensuring that they follow ethical guidelines for publishing on the Web and this is supported by the fact that only 4.2% of them claim to be subjected to accreditation.

Of course, the relative lack of currency of information or source of funding does not necessarily mean that these sites were not up to date or credible; it simply means that patients accessing the sites are less able to assess their overall quality or make a judgment on the information they provide.[26,27]

The results of the present study are consistent with the results of the study conducted by The US Department of Health and Human Services (HHS) which revealed that just 4% of frequently visited health websites disclosed the source of information on their pages and only 2% disclosed how the content is updated[28] Lee et al. also reported that only 9.3% of sites provided references.[29] Howitt et al. also revealed that the source of medical information was provided in 10% of sites.[19] They also reported that date of update was mentioned in 48.8% of the sites, which is consistent with the results reported by Harrison et al., who found that 36.3% of websites provided the date of last update.[30] However, Al-Huziah et al. reported in their study that the references for information provided were available on 58.2% of sites which is not surprising knowing that almost half of the sites (47.2%) were found to be presentation of associations (most of them are organizations of health professionals).[22]

The present work showed that only 8.1% of websites showed evidence of evaluation of information (review process) while 36.3% of sites provided the base for information mentioned which is also consistent with the results described by Marriott et al. stating that only 7% of websites gave an evidence of review process and only 10% of sites supported the claims they made with evidence from scientific research.[20] Also, in the study conducted by Kunst et al. to assess the credibility features and accuracy of contents of 121 websites, they found that only 18% of sites described scientific evidence for information provided.[31] Selman et al. in their study found that an editorial review process was evident in 21/46 (45.7%) website.[27]

These results highlight the lack of regulatory mechanisms provided for posting and reviewing information on the World Wide Web in contrast to the medical literature which is well organized as a result of the peer review system.

Unsurprisingly, the language was clear and simple in 87.9% of sites evaluated in the present study and this result might be due to the fact that sites only in Arabic language or bilingual (Arabic with other language) were included in the study and also to the fact that websites directed only to healthcare professionals were not included.

The present work revealed that 77.7% of the sites showed ease of navigation which is near to the results recorded by Howitt et al., that 100% of websites showed ease of navigation and clear language with correct spelling.[19] Marriott et al. recorded in their study that 90% of evaluated websites had fully functional internal links.[20] Also Selman et al. found in their study that the majority of sites (82.6%) were deemed easy to navigate.[27] This is unsurprising as it is relatively easy for a website to improve its navigability, but ensuring that its claims are supported by valid evidence and referencing all of their sources is a harder and time consuming task.[32]

Studies have shown that most adult Internet users are unaware their movements are being tracked and are also not aware of the personal information gathered about them when visiting a Website.[33]

The present work showed that 9.5% of sites mentioned who collects consumers' personal data and whether or not they share data with others, while 8.1% of sites obtain users affirmative consent to collect or use data in the way described. Those results were not surprising as they depend on the presence of privacy policy on the websites which is lacking on most of the studied websites.

Health Summit Working Group states that it is critical that users be informed of the collection, use, and dissemination of any information they may be providing in visiting the site. Only then, they can make an informed decision to provide the information and/or approve of its eventual use.[34]

On evaluating the privacy in this study, it was not surprising to find that only 8.8% of websites assured users that they prevent unauthorised access to personal data and 1.9% of sites mentioned how they store personal data. These results are consistent with those reported by Al-Huziah et al., who reported in their study poor compliance of studied Arabic Health Websites to confidentiality criteria 39 (31.9%).[22] These results were also noticed by Howitt et al., who recorded in their study that many sites enabled e-mail communication with users, but there was little evidence of sites offering explicit information about security of e-mail and protection of patient confidentiality.[19]

Eysenbach et al. recorded that very few studies evaluated the privacy policy or the possibility to encrypt confidential information.[21] and Goldman and Hudson stated that much personal information shared at Websites is not protected at all by the privacy policy.[35]

A report issued by the California HealthCare Foundation studied the privacy policies and practices of 21 large health-related Websites stated that few sites met fair information practice principles. What's more, the information practices at many sites conflicted with the privacy policies.[36]

Anselmo et al. reported that only 12% of sites provided a privacy policy. In addition, they found that the majority of sites that absolutely require registration do not provide a privacy guarantee. Personal information about patients can be sold to interested third parties without previous approval. Therefore, healthcare providers should ensure that patients understand that personal information on the Internet is poorly protected and confidentiality policies do not always exist[37]

In the present study 42.5% of websites assured that providers of consultations obey the laws and regulations governing professional licensing and prescribing, 46.9% of the sites identified those providing medical consultation while only 43.9% mentioned their professional credentials. This might reflects the fact that the internet has no compelling rules and anyone can publish anything on it. However, these results might also reflect the ignorance of consultation providers about the ethical requirement for online communication with health seekers over the internet.

Eysenbach et al., (2002) found that credentials of physicians were not disclosed in 97.5% of studied sites [21]. On the contrary, in the study conducted by Howitt et al., doctor's names and qualifications were stated in 92.9% and 73.8%, respectively,[19] which might be due to the professional nature of the websites as they were evaluating general practice websites.

Unlicensed, unqualified online information providers have flooded the Internet.[11] There are indications that a quarter of those offering telemedicine consultations directly to the general public do not hold the qualifications they claim and others may be offering advice beyond their qualifications. Studies have shown that there is a wide variation in the quality of advice provided, and, although guidance may generally be sound,

the occurrence of so many outliers is an unacceptable and avoidable risk.[38,39]

Only 17.7% of the sites mentioned limitations of consultations. In the study conducted by Howitt et al., a disclaimer was found in only 27.4% of studied sites.[19] Anselmo et al. in their study reported that a medical disclaimer noting that information provided does not substitute for evaluation by a healthcare team was evident in only 37 (37%) sites.[37] However, Selman et al. reported that a disclaimer was present on 28/46 (60.1%) websites,[27] which is consistent with the results of Marriott et al., who reported in their study that 56% of sites included a legal disclaimer.[20]

5. Limitations of the study

The search strategy implemented in this study could not sample all websites, so the results of this study are not to be generalized.

The present study does not address the quality of the contents of Arabic websites regarding completeness, coverage, accuracy of contents, but it measures adherence of websites to ethical criteria of E-Health Code of Ethics.

6. Conclusion

- Arabic Health Websites shows poor adherence to ethical criteria of E-Health Code of Ethics.
- Studied Arabic Health Websites showed poor adherence to ethical criteria of candor, quality, informed consent, privacy and professionalism in online healthcare.
- Studied Arabic Health Websites showed good adherence to ethical criteria of honesty
- The study has also concluded that relationship between the physician (provider) and the patient (health seeker) over the Internet through Arabic Health Websites could possibly be exposed to risks which might lead to medical responsibility. Reformulation of this relationship should be considered according to international ethical guideline.

7. Recommendations

It is important for physicians to understand the pattern of Internet use among their patients to foresee and dispel possible sources of misinformation. Consumers should be educated how to find credible health information on the web. There should be a system of accreditation of the health websites.

References

1. Broom A. Virtually Healthy: the impact of internet use on disease experience and the doctor–patient relationship. *Qual Health Res* 2005;**15**(3):325–45.
2. Kwankam S. What e-health can offer? World Health Organization. *Bull World Health Organ* 2004;**82**(10):800–2.
3. Maloney S, Ilic D, Green S. Accessibility, nature and quality of health information on the internet: a survey on osteoarthritis. *Rheumatology* 2005;**44**(3):382–5.
4. Internet World Stats. Internet usage in the Middle East; 2008. Available at: <http://www.internetworldstats.com/stats5.htm>.
5. Murray E, Lo B, Pollack L, Donelan K, et al.. The impact of health information on the Internet on the physician–patient relationship. Patient perceptions. *Arch Intern Med* 2003;**163**:1727–34.
6. Cline RJW, Haynes KM. Consumer health information seeking on the Internet: the state of the art. *Health Educ Res* 2001;**16**(6):671–92.
7. Federal Trade Commission. Privacy online: fair information practices in the electronic marketplace. A report to congress. Washington, DC: Federal Trade Commission; 2000. Available at: <http://www.ftc.gov/os/2000/05/index.htm#22>.
8. AMA. Creating a cyber doctor–patient relationship 2001. In: amednews.com. Available at: <http://www.ama-assn.org/amed-news/2001/08/06/prca0806.htm> Retrieved on 20/6/2010.
9. Lawrence RS. The physician perception of health care; the knowable and the known. *J Roy Soc Med Suppl* 1994;**87**(22):11–3.
10. Fox S. Online health research is widespread, but few check the source and date. *MedGenMed* 2007;**9**(1):30.
11. Dyer KA. Ethical challenges of medicine and health on the Internet: a Review. *J Med Internet Res* 2001;**3**(2):e23.
12. Baur C, Deering MJO. Proposed frameworks to improve the quality of health web sites: review. *MedGenMed* 2000;**2**(3):e35, 26.
13. Kind T, Silber T. Ethical issues in pediatric e-health. *Clin Pediatr* 2004;**43**(7):593–9.
14. Rippen H, Risk A. E-Health Code of Ethics. *J Med Internet Res* 2000;**2**(2):e9.
15. Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet. *JAMA* 1997;**277**(15):1244–5.
16. Kim P, Eng T, Deering MJ, Maxfield A. Published criteria for evaluating health related websites; review. *BMJ* 1999;**318**:647–9.
17. Eysenbach G, Köhler C. How do consumers search for and appraise health information on the World Wide Web? Qualitative study using focus groups, usability tests, and in-depth interviews. *BMJ* 2002;**324**(7337):573–7, 9.
18. Fogg BJ, Soohoo C, Danielson D, Marable L, Stanford J, Tauber E. *How do people evaluate a web site's credibility?* Stanford, CA: Stanford Persuasive Technology Lab. Sponsored by Consumer Web Watch; 2004. <http://www.consumerwebwatch.org/news/report3_credibilityresearch/stanfordPTL_abstract.htm>.
19. Howitt A, Clement S, De Lusignan S, Thiru K, Goodwin D, Wells S. An evaluation of general practice websites in the UK. *Fam Pract* 2002;**19**:547–56.
20. Marriott JV, Stec P, El-Toukhy T, Khalaf Y, Braude P, Coomarasamy A. Infertility information on the World Wide Web: a cross sectional survey of quality of infertility information on the internet in the UK. *Hum Reprod* 2008;**23**(7):1520–5.
21. Eysenbach G, Powell J, Kuss O, Sa E. Empirical studies assessing the quality of health information for consumers on the World Wide Web: a systematic review. *JAMA* 2002;**287**(20):2691–700, 22.
22. Al-Huziah M, Al-Kahtany M, Al-Ammari R, Al-aiz R, Boyer C, Al-Tuwaijri MM, et al. Assessment of online health information for Arabic sites 2010. Available at: <http://www.hon.ch/Global/HONArabic.html>. Published online on 6/2/2010. Retrieved on 3/5/2010.
23. Martins EN, Morse LS. Evaluation of internet websites about retinopathy of prematurity patient education. *Br J Ophthalmol* 2005;**89**:565–8.
24. Griffiths KM, Christensen H. Quality of web based information on treatment of depression: cross sectional survey. *BMJ* 2000;**16;321**(7275):1511–5.
25. Okamura K, Bernstein J, Fidler A. Assessing the quality of infertility resources on the World Wide Web: tools to guide clients through the maze of the fact and fiction. *J Midwifery Womens Health* 2002;**47**:264–8.
26. Huang J, Discepola F, Al-Fozan H, Tulandi T. Quality of fertility clinic websites. *Fertil Steril* 2005;**83**:538–44.

27. Selman T, Prakesh T, Khan K. Quality of health information for cervical cancer treatment on the internet. *BMC Womens Health* 2006;**6**:9–13.
28. Fox S. Online health search 2006. The Pew Internet and American Life Project 2006. Available at: <http://www.pewinternet.org/Reports/2006/Online-Health-Search-2006.aspx>. Retrieved in June 2007.
29. Lee JS, Moon TG, Kim HJ, Lee HJ, Lee JH, Shim SG, et al.. An evaluation of web-based information about gastro-esophageal reflux diseases in Korea. *Korean J Gastroenterol* 2007;**49**(4):231–7.
30. Harrison S, Barlow J, Williams G. The content and interactivity of health support group websites. *Health Educ J* 2007;**66**:371–81.
31. Kunst H, Groot D, Latthe PM, Latthe M, Khan KS. Accuracy of information on apparently credible websites. Survey of five common health topics. *Br Med J* 2002;**324**:581–2.
32. Epesstein Y, Rosenberg H. Assessing infertility information on the internet: challenges and possible solutions. *Fertil Steril* 2005;**83**:553–5.
33. Internet Healthcare Coalition. New survey shows disparity between Web developers and consumers over Health Internet; 2000. Available at: <http://www.ihealthcoalition.org/about/ihc_pr8.html>.
34. Health Summit Working Group. Criteria for assessing the quality of health information on the Internet – Policy Paper; 2000. Available at: <http://hitiweb.mitretek.org/docs/policy.html>.
35. Goldman J, Hudson Z. Virtually exposed: privacy and E-Health: privacy concerns are keeping consumers from reaping the full benefit of online health information. *Health Aff* 2000;**19**(6):140–8.
36. Goldman J, Hudson Z, Smith R. Privacy: report on the privacy policies and practices of health web sites. California HealthCare Foundation; 2000.
37. Anselmo MA, Lash KM, Stieb ES, Haver KE. Cystic fibrosis on the internet: a survey of site adherence to AMA guidelines. *Pediatrics* 2004;**114**:100–3.
38. Eysenbach G, Diepgen TL. Responses to unsolicited patient e-mail requests for medical advice on the World Wide Web. *JAMA* 1998;**280**:1333–5.
39. Sandvik H. Health information and interaction on the internet: a survey of female urinary incontinence. *BMJ* 1999;**319**:29–32.
40. Van Meter KM. Methodological and design issues: Techniques for assessing the representatives of snowball samples. Research Monograph Series. Mono, vol. 89. National Institute on Drug Abuse; 1990. p. 31–43.