

and interpretation of data, and drafted the paper. EVB was involved in the conception and design of the study, collection of data on links, interpretation of data, and drafting of the paper. NQM carried out the statistical analysis. KKH, FCA, MIR, HMK, and REP were involved in interpreting the data and revised the paper for intellectual content. MAM and SES advised on methods and revised the paper for intellectual content. FM and EVB are the guarantors.

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Accuracy of information on apparently credible websites: survey of five common health topics

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The internet provides an easily accessible forum to disseminate both accurate and inaccurate health information—so it has the potential to facilitate but also to jeopardise healthcare provision.^{1,2} Many criteria have been alleged to capture the quality of health websites,^{3,4} but the validity of these criteria needs to be examined.⁵ The source, currency, and hierarchy of the evidence posted on a website may be used to judge its credibility—that is, the power of inspiring belief. If these criteria were fulfilled, the contents of the website would be expected to be accurate. We determined whether websites that seem to be credible provide accurate health information.

Methods and results

We determined the relation between credibility features and accuracy of contents of 121 websites that provided information on five common health topics: chronic obstructive pulmonary disease (23 sites), ankle sprain (36), emergency contraception (32), menorrhagia (9), and female sterilisation (21). These sites were identified either by searching each of the most commonly used engines (such as Altavista, Excite, Hotbot, Infoseek, Lycos, Northern Light, Webcrawler) or by simultaneously consulting them using a meta-search engine, Copernic 4.1 (www.copernic.com/). We

selected English language websites whose content provided information about the topics. Website selection and data extractions were performed in duplicate, and agreement between the two assessors was high.

The entire contents of the selected websites were assessed for three credibility features (source, currency, and evidence hierarchy) and accuracy of contents. Source and currency are widely used to assess scientific credibility of a website.^{3,4} The source of medical information is usually regarded as the main criterion for its credibility; sites should display the source of the information clearly. Currency is shown by websites that display the date of the original document or content posting on the internet, and that of any updates. We looked at the hierarchy of evidence posted on each website, examining whether the levels assigned to various pieces of information were related to their validity or methodological quality. This allows users to assess the strength of the recommendations being made. Our assessment showed that 113/121 (93%) websites described source, 59 (49%) currency, and 22 (18%) evidence hierarchy.

Accuracy of website contents was judged against rigorously developed, peer reviewed, and published guidelines for each of the five health topics (see table on bmj.com). The data on accuracy were extracted as a proportion of guideline statements included in the

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A table of sources of websites appears on bmj.com

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Relation between credibility of website and accuracy of website's contents. Values are numbers (percentages) unless otherwise indicated

Feature of website credibility	Levels of accuracy*			Rank correlation	
	I	II	III	Kendall's tau b	P value
Description of source:					
Present (n=113)	27 (24)	42 (36)	44 (39)	0.15	0.48
Absent (n=8)	1 (12)	1 (12)	6 (76)		
Description of currency:					
Present (n=59)	20 (34)	19 (32)	20 (34)	0.21	0.05
Absent (n=62)	8 (13)	24 (39)	30 (48)		
Description of an evidence hierarchy:					
Present (n=22)	7 (32)	10 (45)	5 (23)	0.16	0.25
Absent (n=99)	21 (21)	33 (33)	45 (46)		

*Level I: more than two thirds of guideline statements covered; level II: one third to two thirds of guideline statements covered; level III: less than one third of guideline statements covered.

website's contents and they were converted into three accuracy levels. In level I, more than two thirds of guideline statements were covered (28/121 (24%) websites); in level II, one third to two thirds of guideline statements were covered (43 (35%) websites); in level III, less than one third of guideline statements were covered (50 (41%) websites).

We examined the relation between features of website credibility and level of accuracy of contents by cross tabulation and assessed the strength of association with Kendall's rank correlation, which adjusts for tied ranks in the data. The value of the coefficient (tau b) ranges from -1 to 1. Interpretation is subjective, but values near zero may be taken to indicate no correlation whereas values near 1 indicate a strong correlation. As shown in the table, websites with description of credibility features tended to have higher levels of accuracy of contents, but this relationship was not strong.

Comment

Our study shows that features of website credibility—source, currency, and evidence hierarchy—have only

slight or at best moderate correlation with accuracy of information in five common health topics. Thus, apparently credible websites may not necessarily provide higher levels of accurate health information.

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Follow up of quality of public oriented health information on the world wide web: systematic re-evaluation

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In 1997 one of the first studies to evaluate the quality of health information on the internet was published.¹ This article assessed the reliability of information for managing fever in children at home and found that the quality of information was poor. Four years after publication these findings were mentioned in 78 journals (from *Journal Citation Report*), and the message should therefore have reached a wide audience. We investigated the effects of the earlier findings by re-evaluating the quality of the original web pages four years later, as well as that of a more recent sample of pages, using the same methods.

Methods and results

On 28 June 2001 we searched articles through the Institute for Scientific Information's citation index for references to the earlier study.¹ We searched for the 41 web pages evaluated in the original study to see if they still existed and if they did whether they had been substituted with new pages or their content had been modified. We compared the content with copies of the original pages, and we noted changes and assigned scores by using the guidelines and scoring system applied in the original study.¹ We then repeated the 1997 search for new pages, found 40, and scored them as well.