Exploring trust in online health information: a study of user experiences of patients.co.uk

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Abstract
This article has been co-authored by Anna Cunningham and her supervisor Frances Johnson. It is based on the research Anna conducted for her dissertation, which she completed as part of her MA in Library and Information Management at Manchester Metropolitan University. The study explored how people assess the trustworthiness of online health information, and the participants were asked to talk aloud whilst viewing information on the consumer health information website patients. co.uk. The study confirmed that their assessment was based on the information usefulness and credibility as well as identifying the factors relating to
information quality and website design that helped to form these judgements. A. M.

Introduction
This article reports on a study which explored users' evaluation of information found in health information seeking contexts. Based on the method of concurrent talk-aloud, where research participants describe their actions in a particular situation, an unstructured interview was employed to encourage participants to talk about their assessment of the trustworthiness of the information found on the consumer health information website, patients.co.uk[1]. Previous models of trust in online information suggest that a judgement of trustworthiness is formed on the criteria of usefulness alongside other assessments, such as information credibility.[2] This study set out to identify these criteria specifically in the participants' own words and in the health information context. Furthermore, the study set out to make an important distinction on the impact that the information quality has on this judgement, alongside the impact of the website itself and its design as the provider of the information.

Background
Previous research to identify the criteria by which we assess online information has established that these will relate to a perceived usefulness and credibility of the information.[3] In modelling trust judgement, to determine its predictive power with regard to a person's intention to use information, Johnson et al[3] distinguish the criteria of usefulness and credibility from their influencing factors, such as the authorship or style of the information. Thus we might assess online health information by its credibility which will be influenced by certain key factors. However, as pointed out in Kelton et al,[4] whenever we use the term trust we are of necessity implying trust *in* a certain something or someone. Within e-health research 'trust' has been talked about with respect to a given website to provide accurate information.[5] In this vein, Johnson et al[3] found that the assessment of the trustworthiness was not only influenced by factors relating to the information itself but may also be influenced by an assessment of the search engine or the website, as the provider of the information. This may further suggest that whilst we might assess online health information by its usefulness and

its credibility we will also form some judgement of the trustworthiness of the website. Intriguingly, Kelton et al[4] provide a link between an assessment of the trustworthiness of the information and the website in the concept of the user's identification with the information. They argue that a sense of common ground comes about when there is conformity between the information and "the user's own identity, goals and values" or resonance of the user with the information's "style, arguments, or objectives"[4] and that identification plays a role in creating faith in information. In other words, we might not have 'trust' as a criterion in the evaluation of the website information but we might assess our identification with the information and this is formed by some assessment of the website. To see it as 'like us', makes us more likely to trust it, just as to identify with another human being makes us more likely to have faith in her or him. Sillence et al[6] found that participants using the health website DIPEx were happy when they found the story of "someone who was 'a bit like me'". In their work of 2007[7,8] they defined this as *social identity, the* users' feeling that a website was "written for people like themselves" and that they could "relate to it". Our aim was to investigate further how people evaluate the trustworthiness of health information. In particular, to gain a deeper insight into the assessment of information credibility and to explore the assessment of the trustworthiness of the website as the provider of the information.

Method

The task assigned to the study participants was to search for information about a health condition using the website patients.co.uk, which has health information aimed at the general public. The 11 participants (denoted P1-P11) were purposely selected to obtain a range across age groups, gender and employment and they were given free rein to look for information. In this open task, participants chose to look for information about a health condition from their past that they knew quite or very well and did not feel in need of new information. Whilst this may have resulted in participants placing less emphasis on an assessment of the information usefulness, nonetheless a situation was created in which the trustworthiness of information found, and about which participants cared, was assessed. The initial coding scheme was drafted on the trust-criteria of usefulness, credibility, identification and the influencing factors, such as the style of the information or the design of the website, were collated were collated from the previous studies that were reviewed in setting the background context. The final coding scheme in Table 1 was produced in a process of directed content analysis of this study's interview data, whereby the themes of the coding scheme were elaborated upon emergently as the researcher was exposed to the data.

Table 1 Coding Framework: What does trust in digital health information depend on?

Criteria	Indicators of influencing factors
Information Quality, based on Style, Structure, Accuracy, Coverage, Objectivity, Validity	- Length of sentences - Use of technical vocabulary - Level of formality - Use of headings and sub-headings - Bullet points - Paragraphs - Freedom from factual error - Completeness - Absence of bias, deception and distortion - Correct citation practices - Reliable methods
Credibility of the information	- Perceived absence of bias, distortion and deception - Perception of accuracy, as from comprehensibility and triangulation

Reputation, Authority, Recommendation	• Resource is displayed on a site with details identifying an originator of known good standing and expertise • Cites a university, academics, a medical journal • Has favourable reviews from peers • Has a celebrity endorser who is respected
Identification with the information	• Perceived recognition or identity
Usefulness of the information	• Satisfied the information need
Website evaluations of character and user identification with	• Competence – Is it the website amateurish? • Motives – does the site seek to exploit? Is the site focused on its users' health needs? • Possible role of identification
Website evaluation of Ease of Access/Usability	• Website resembles sites used before and is predictable • The user does/does not get lost while using the website • The user is/is not frustrated when finding information

In the scope of this paper and in the following description of the participants' assessment of online health information we focus on the articulation of the following criteria and influencing factors.

Criteria
- *Credibility.* A positive evaluation or impression of quality of the information and/or website,
- *Identification.* An evaluation of the conformity of the information and/or website to the users and their goals

Factors
- *Style* - as reference to information qualities,
- *Design* - as reference to the website quality and appeal.

The constructs of trust – information quality, credibility and identification

Unsurprisingly, when asked whether it was important for the health information to be impartial and objective, all users answered that it was; many explicitly stated that if it was not, they would have less confidence or trust in it. P1, for instance, felt that the impartiality of the information was

> "[…] *crucial. Absolutely crucial*"

With regards to the factors influencing the assessment of credibility, participants' gave an indication that some of these may be more influential than others. As an example, P3 appeared to weigh reputation whereas P1, by contrast, made no mention of authors, references, citations, the website's owners or anything else associated with authority, until he was asked about authorship, and at this point he said

> "*Now that I've seen [the credentials of the authors], it hasn't really changed my...*" (P1)

In P1's words, if the exposition of a phenomenon "made sense" to a user, if it could be understood, this was a significant part of the way to believing that the information was accurate. The writing style of the resource, in terms of its use of technical vocabulary, the length of its sentences, use of bullet points, use of headings and the general linguistic organisation of the information were commented upon, notably by P1, P3, P7, P8, P6 and P9, and with seemingly an effect upon how credible they found the information. P1's commentary on the health information leaflets revolved around how clear he considered the explanations and said at one point

> "*The information came over very clearly, it was written in a way that I could easily understand it.*" (P1)

P4, P3and P6 also responded positively to the accessibility and clarity of the explanations on patient.co.uk; P4 found it

> *"really easy to read,"* (P4)

P5 deemed it

> *"very readable, very clear, it's laid out, you know, very nicely,"*

and for P3 it was

"readable for anybody, so anybody could probably understand it".

These comments are illustrative of the way in which style has an effect upon a user's trust in the information, as P1 commented:

> *"that's a very good summary. [...] The sentences are very short, and clearly convey information. [...] that's said what rheumatoid arthritis is. That's a very good first sentence."* (P1)

In addition to credibility, the results of the interviews bear out to an appreciable extent the idea that there is a further *something* that affects how happy users are with the health information. It appeared that Identification (as defined by Kelton[4] and adopted here) can play a role in trust relating to the conformity of the information to the user's identify and goals and resonance of its style, arguments, or objectives. In the present study, participants' comments that referred to scope offer the most insight, that is whether or not the information is at the *right level* or *right amount* for the user preferences and needs. P2 has a PhD in chemistry, and at first professed little confidence in the information on the website. Her very first remark was to say

> *"I'm a little bit put off by the title 'patient.co.uk'"* (P2)

and indicated that she did not want to be assumed to be ignorant. However, when asked, "Did you identify with the website?" P2 responded

> *"Yes, yes, funnily enough. Having clicked on this [Professional Reference section] [...] funny how one thing can have a big effect, can't it?"* (P2)

Whether P2 had actually experienced a sense of common ground on finding the section cannot be determined, however P4 appeared to express this sentiment with respect to her rare form of asthma. She referred repeatedly to the fact that the first asthma-related page that she had found did not make it clear that her form of the condition existed, saying,

> *"I wouldn't necessarily be convinced that I had asthma [...] I'd have been happier if it had specified the different types of asthma".* (P4)

When she found a page about asthma that she liked, she read out loud with particular emphasis the parts of the information that she said reflected her own experiences and symptoms. Perhaps an assessment of the *scope* of the information, being at the right level of complexity and depth, creates a sense of identification with the information. In this, their words resemble the findings of Sillence et al[6], whose qualitative study of patients with hypertension had found that participants using the health website DIPEx were happy when they found the story of "someone who was 'a bit like me'".

The constructs of trust – website design, credibility and identification

The analysis of the participants' words gave particular focus to their assessment of the website itself as distinct from the assessment of the information. Beyond comments about the site's usability, however, few made any comments on the design of the website. P6 passed more general comment on its overall appearance, saying

> *"It's got a bit of an old-fashioned look about it, ... I think it could be... updated to have a more modern look, and a more sort of attractive look, and a more inviting look about it, really."* (P6)

P6 appeared not to like certain aesthetic aspects of the site, although her consistently favourable assessment of the information credibility seemed to indicate that her opinions of the website design had no effect. However, when asked how interested and engaged she had been while using the website, she cited the "old-fashioned-ness" as a reason for only being moderately so, saying,

> "*Maybe I would have been engaged with it more if it had appealed to me a little bit more.*" (P6)

Intriguingly, this response might suggest that the design of the website, as a conveyer of the information, may influence the user's disposition towards or willingness to engage in the critical evaluation of the information. Was this the bonding or emotional reaction of users to the design features proposed in Kelton et al's[4] model of trust in information? P5's general response to the site's visual appearance and its features seemed to be one of alienation rather than identification. A variety of features, such as the tracker apps, persuaded P5 that the website was not a reliable health resource, not only commercial but, in his word, "gimmicky" and this made him profoundly prejudiced against its content. Indeed the participants who objected to advertisements appeared to feel that while a health site has profit in mind, their needs and feelings are not being prioritised and treated with consideration and sympathy. However, for some,

> *"[...] there wasn't an overuse of advertising, to the extent that it made me feel I was being... used*.

For others, this characteristic led to the opinion that when looking for health information

> *"[I] would try and find [...] sites that would not be something like that [patient.co.uk], that are not trying to sell you something".*

Discussion and Conclusion

This paper explores the question - how people evaluate information – relating to the assessment of the trustworthiness of online health information. A small number of key observations can be made with regards to the factors influencing this judgement. In particular, the perceived information style seemingly had an effect on the assessment of its credibility. However, considering authority indicators, it was interesting to note that from this study group there was an apparent willingness to draw on one's own expertise to assess information credibility. Identification as a construct in the assessment of the trustworthiness seems to involve the user in answering the question is it 'right for me' and relates to a perception of the information scope. Interestingly, identification with the website relating to its design, such as the overall appeal or the presence of certain features such as adverts, seemed to influence a willingness to engage with the information presented and hence indirectly with a judgement of its trustworthiness. This study involved only a small number of participants and it was apparent that there was variation in the extent to which information/website style/design influenced credibility and identification and further had an effect on evaluation and usage. Further research on a larger scale might usefully explore this variation across different user

groups. For example, the influence of the information style/website design may vary across participants grouped by the demographics of age and/or in the context of health information seeking, by the type of health issue that lead to the information sought. Ultimately further study of the information behaviour of trust and credibility assessments may help online heath information providers gain insight for the design of health websites. It is evident that people form a perception of credibility of the information and of the website and the more that they are helped, through design of the influencing factors to be used as evidence, it seems more likely that an assessment of trustworthiness will be made. Towards this end, health information providers would contribute to encouraging the evaluation of the information found and the user's adoption and use of information assessed to be trustworthy.

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