Using Information Technology To Improve Health Information Literacy In Singapore – An Exploratory Study

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Abstract:

With many countries facing restructuring of medical and healthcare institutions, increasing healthcare costs, and various infectious diseases and epidemics, such as avian influenza and dengue haemorrhagic fever, it is inevitable that healthcare information be a major tool in addressing these issues. Hospital professionals and healthcare providers may not always be available to attend to the needs of the masses with regard to health information. Thus, health information must be made easily accessible so that preventive action and proactive measures can be carried out by patients and their families. The proliferation of the Internet and swift developments in information technology (IT) can effortlessly expedite this accessibility. In this exploratory study, twelve individuals with medium to high IT competencies and substantial experience in using the Internet were interviewed on their health information needs and expectations. The paper presents their responses and suggestions to improve health information provision and literacy, and how IT can be exploited to achieve these objectives.

Keywords: Health information literacy, Health literacy, Healthcare information, Singapore

1. INTRODUCTION

Picture this: During a routine health check, the doctor detects some cackling sounds in your lungs. Being cautious, he decides to send you for a chest x-ray. It turns out that you are suffering from pulmonary alveolar proteinosis, which is a rare disease often associated with infection or immune deficiency. In some people, there are no symptoms. The doctor tells you that he will give you some medication to help clear your lungs, and asks you to come back for a review in a month’s time. If your condition does not get better, you will be sent for a lung lavage, which is essentially a “washing” of the lungs. He then ends the consultation as he has many more patients to see for the day.
Still reeling from the shock of hearing the doctor’s diagnosis, you are unable to think, much less ask more questions regarding your illness and the doctor’s prognosis, and treatment options. Come to think of it, you can barely recall the name of the illness that you are suffering from.

Health issues can be extremely intricate and perplexing. Even the most educated people are at a loss when they are confronted with a major health crisis, and can barely understand what their doctors are telling them about their illnesses [1]. To make matters worse, they do not know where to go or who to turn to in order to learn more about their illnesses and what they can do about it.

2. HEALTH INFORMATION LITERACY

2.1 What is health information literacy?

Although a lot of money, time and effort have been spent on studying increasing healthcare concerns, worrying medical conditions, and rising healthcare costs, not enough has been done to improve a crucial causal component, which is health information literacy. Health information literacy can be defined as the ability to find, evaluate, interpret, understand and subsequently use information to promote and sustain health [1; 2].

2.2 The need for health information literacy

Studies have found that in the United States alone, almost half of the adult population find it difficult to understand and act on health information [3]. They get confused by medical terms [1; 4], and keep silent rather than ask their doctors important questions regarding their health concerns or medical conditions [5]. This situation is exacerbated by the existence of new drugs, treatments and procedures, and the increasingly complex and changing nature of diseases. Patients have found that they need to wait longer than before just to get an appointment with their doctors, and they that have less direct access to their healthcare professionals [6]. This translates to patients having less time with their doctors and other healthcare professionals, and thus they have fewer opportunities to talk and ask questions about their healthcare concerns and medical conditions. In addition, numerous changes in the healthcare system, with regard to healthcare policies and medical insurance plans, have also required more individual responsibility for disease prevention, self-management of chronic diseases, and informed decision-making and consent [2].

Research has also shown that patients with low health literacy usually require two to three times as many doctor visits in order to develop adequate understanding of their health problems, and information and instructions given by their doctors, compared to those with high health literacy [1]. It must be emphasised, however, that an individual’s health information literacy is not necessarily associated to their educational level [7]. In other words, it does not mean that a highly educated person is also competent in looking for health information. Besides, it has been found that patients with low health literacy have relatively poorer health and higher hospitalisation rates [3]. Both situations inadvertently lead to higher healthcare costs that can total billions of dollars globally.

The widespread use of information technology (IT) and the proliferation of the Internet have consequently led to the availability of abundant online information. The Internet has become a tool of choice for consumers and patients to use when looking for healthcare information [8]. Patients now have greater access to healthcare information, and the control of its availability and content has shifted from physicians to patients [9]. Although this new scenario has its advantages, in that patients and consumers have greater access to healthcare information and are able to make better decisions, one main problem is that those who are looking for healthcare information are not always able to find
what they need [10]. Certain skills are required to be able to effectively search, identify, retrieve, select, evaluate and use the information from the huge collection of Internet resources available.

3. ISSUES RELATED TO HEALTH INFORMATION ON THE INTERNET

3.1 Availability of health information

Regardless of the format that health information is found in, be it brochures, self-care pamphlets, patient education handouts, and even insurance forms, the level of literacy required to understand these materials is relatively high [2; 8] and is found to be around a 10th grade reading and comprehension level [5; 7]. This means that consumers and patients need at least secondary or high school level education before they can comprehend health or medical information effectively.

To aggravate the complexity of health information available in print format, there is the abundance of health information available online; both authoritative and non-authoritative. One major concern is the quality of online health information, as poor quality information can lead to patients putting themselves or their family members at risk [8] through wrong self-diagnosis and treatment [2].

3.2 Access and evaluation of health information

Many consumers and patients use general search engines to look for health information. However, search engines are not extremely efficient in locating relevant and authoritative health information. Thus, the right and relevant information is available but is not searchable [10]. Many stick to single search engines such as Google [11] or Yahoo!, and are not aware of using parallel meta-search engines such as Dogpile or Search.com to help them widen their search and look up and compare search results.

Medical or health information databases, such as Medline, and Combined Health Information Database (CHID), offer more authoritative information. However, documents found in these databases are not easily retrieved by general search engines due to dynamic web pages that are constantly updated. In addition, good search strategies with specific terms are required when searching in these databases. Colloquial and common names of illnesses and medical conditions are not easily recognised or searchable [12].

It is also important that the language in which healthcare information is delivered be at a level that consumers and patients can easily comprehend [9; 12]. The use of images and graphics can also make it easier for consumers and patients to understand complicated concepts, procedures or conditions more easily [1].

Even when consumers and patients are able to obtain relevant health information through search engines, issues such as authority, accuracy and credibility are often not checked or considered [2; 13]. They tend to believe most of what they read online. However, it is not always easy to teach consumers and patients the different evaluation criteria when it comes to choosing relevant health information. It then becomes necessary to ensure online health information adheres to several basic criteria to guarantee its authority, accuracy and credibility [9], so that consumers and patients can immediately gain access to high quality information.

3.3 Asynchronous and synchronous communication of health information

Asynchronous communication involves an elapsed time between a message conveyed by the sender and the response given by the receiver. Conversely, synchronous communication occurs when
the message conveyed by the sender is immediately responded to by the receiver, and occurs in real-time. Examples of asynchronous communication include email, postings on discussion boards and text messaging on mobile phones, whilst examples of synchronous communication include telephone conversations, online instant messaging and meetings.

In communicating health information, consumers and patients are found to not only want a healthcare information system whereby the information is authoritative, accurate and credible; they also prefer a health advice system that allows both asynchronous and synchronous communication to take place [2]. For instance, consumers and patients can send queries to health professionals or medical experts asynchronously via email [8], or they can post their queries on a discussion board and get other consumers or patients to respond by sharing their experiences. Similarly, they can seek the help of health professionals or medical experts synchronously via a hotline number.

4. STATEMENT OF PROBLEM – THE SITUATION IN SINGAPORE

The imminent ageing population and increasing healthcare costs in Singapore are slowly taking its toll on the healthcare sector [14]. Hospitals frequently report a shortage of beds and manpower, whilst polyclinics often have long queues of patients who easily have to wait about three to four hours before they get to see the doctor [15]. This is because a doctor at a polyclinic normally sees up to almost 60 patients a day [16] some for the most trivial reasons [17]. Due to the overwhelming patient numbers in polyclinics, it is inevitable that miscommunication and medical errors occur [18].

Although the government has increased its spending on improving healthcare infrastructure [19], a study has found that generally, what patients experience in terms of service and quality in Singapore hospitals is still below their expectations [20]. It has been found that patients feel their doctors do not thoroughly explain medical conditions to them, do not sufficiently obtain feedback from them, and do not adequately understand their specific needs. In addition, patients often lament that they usually have to wait more than an hour to just see their doctors.

While the expected completion of a new hospital in Yishun in 2009, and the creation of the post of Advanced Practice Nurses (APN), who are able to attend to less critical cases independently of doctors [21], may alleviate the situation, it is unlikely that patient numbers in hospitals or polyclinics will reduce drastically or that patients’ service and quality expectations will be instantly met. Consumers and patients should be more capable and autonomous in managing their health and minor ailments, instead of approaching their doctors or healthcare professionals at for minor health or medical concerns. The use of IT and the Internet should be able to expedite consumers’ and patients’ management of their health and healthcare concerns more effectively. It is with this contention that a small-scale qualitative study was carried out with a convenient sample of 12 individuals with medium to high IT competencies and substantial Internet use and experience, to determine their level of health information literacy, and their expectations and recommendations on the use of IT in improving health information literacy in Singapore.

5. DATA COLLECTION

5.1 Demographics

Semi-structured interviews were carried out with a sample of 12 individuals. Each interview session lasted between ten and 15 minutes. Their responses were recorded on paper and transcribed. Table 1 presents the demographic information of the respondents who were interviewed.
Table 1: Demographics of interview respondents

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Sex</th>
<th>Age</th>
<th>Highest Educational Qualification</th>
<th>Profession</th>
<th>No. of years of using Internet</th>
<th>IT competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F</td>
<td>20</td>
<td>Pre-university/diploma Student</td>
<td>2 – 5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>F</td>
<td>22</td>
<td>Pre-university/diploma Student</td>
<td>&gt;5</td>
<td>Very high</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>M</td>
<td>25</td>
<td>Pre-university/diploma Student</td>
<td>2 – 5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>F</td>
<td>26</td>
<td>Postgraduate Research staff</td>
<td>&gt;5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>M</td>
<td>23</td>
<td>Pre-university/diploma Student</td>
<td>&gt;5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>23</td>
<td>Pre-university/diploma Student</td>
<td>&gt;5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>F</td>
<td>30</td>
<td>Secondary Administrative Assistant</td>
<td>&gt;5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>M</td>
<td>20</td>
<td>Pre-university/diploma Student</td>
<td>2 – 5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>M</td>
<td>18</td>
<td>Secondary Student</td>
<td>2 – 5</td>
<td>Very high</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>F</td>
<td>29</td>
<td>University degree Teacher</td>
<td>2 - 5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>M</td>
<td>30</td>
<td>Postgraduate Medical officer</td>
<td>&gt;5</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>M</td>
<td>37</td>
<td>University degree Civil servant</td>
<td>&gt;5</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Issues of contention

During the interview, the respondents were asked to give their opinions on the following issues:-
(a) patient-doctor relationship
(b) health information seeking in general
(c) health information seeking through the Internet
(d) evaluation of health information obtained through the Internet
(e) use of IT in improving health information provision

5.3 Responses

(a) Patient-doctor relationship

Respondents were asked whether they had looked for health information on their own. Out of the 12 respondents, only two replied that they had never done so. When probed further as to why it was the case, these two respondents (E and I) replied that there had never occurred a need to look up health information on their own, as their health concerns and queries were adequately addressed and answered by their family doctors.

The ten respondents were asked when they would normally look up health information. Five respondents said that they do so before seeing the doctor for an ailment (B, D, F, G and J), whilst three respondents do so after seeing the doctor (A, C and H). Two respondents (K and L) look up health information that is unrelated to any doctor visits, out of interest or curiosity.

Respondents were also asked how often they understand their doctor’s diagnosis and prognosis of ailments. Four respondents replied that they understand their family doctors all the time (C, E, K and L), whilst seven respondents replied they understand most of the time (B, D, F, G, H, I and J). When asked further, these respondents replied that they do not understand everything that their doctors say, and would look up more information to clarify their doubts or queries, and to better understand what they have been told by their doctors. Only one respondent (A) replied that she sometimes understands her doctor, and definitely needs to look up more related information.

(b) Health information seeking in general

For the ten respondents who replied that they had looked up health information before, they were asked what sources they used to seek the needed information. Their responses are given in Table 2.
<table>
<thead>
<tr>
<th>Respondent</th>
<th>Books</th>
<th>Internet</th>
<th>Journals</th>
<th>Magazines</th>
<th>Pamphlets</th>
<th>Television</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>D</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>H</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>J</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>L</td>
<td>✓</td>
<td>✓</td>
<td></td>
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</tbody>
</table>

It can be seen that the majority of the respondents looked up health information through the Internet, followed by magazines and books. They were further asked to estimate how often they sought health information through the Internet, compared to other sources. Eight respondents estimated that they did so approximately 70% or more of the time.

(c) Health information seeking through the Internet

Out of the nine respondents who looked up health information through the Internet, it was found that eight of them used search engines, either exclusively or together with specific websites such as the United States National Institute of Health (NIH) or Singapore’s Health Promotion Board (HPB), or with databases such as Medline. The remaining one respondent who did not use search engines usually goes directly to a specific health website such as NIH or HPB.

The respondents were asked to rate how easy or difficult they perceive searching for health information on the Internet. Seven respondents replied that they found it either somewhat easy or very easy, whilst two respondents were rather neutral. When probed further, the two respondents (J and L) elaborated that although it was easy to use search engines to look for health information, it was sometimes difficult to get to the information that they needed. This is because of an overload of information available and the issues of authority, quality, credibility and accuracy.

(d) Evaluation of health information obtained through the Internet

The respondents were also asked how they evaluated health information found on the Internet. Six respondents replied that they normally compare information from different websites (A and H), judge based on the authors and their credentials (B and K), or do both (J and G). The three other respondents mentioned that information found online should be credible since they are in the public domain (C). However, one of them indicated that information should still be compared across different websites (D), or that at least the authors and their credentials should be considered (L).

(e) Use of IT in improving health information provision

The respondents were asked for their opinion on posting their health problems or medical queries to a virtual doctor or medical expert. Ten respondents agreed that it was a good idea. However, one of them (G) added that she would do so only if her concerns or queries are not urgent. If she or a family member was facing a threatening medical situation and immediate answers were needed, she would not bother posting her queries online. Two respondents (D and H) said that they would not post their queries online. Respondent D elaborated that she is not comfortable divulging her personal medical history to someone she does not know, unless there is video-enabled communication (synchronous) so that she can see the person she is talking to or unless she is assured of the person’s credentials and expertise. Respondent H explained that it is not easy to textually describe health concerns or medical
queries, and that sometimes, patients need a doctor or medical expert to be there in person or real-time in order to diagnose certain ailments or medical conditions.

Similarly, they were asked for their opinion on posting their health concerns or medical queries on an online discussion forum. Eight respondents agreed that it was a good idea to share experiences. Four respondents (A, D, E and G) disagreed with this idea. Respondents A and G felt that different people have different experiences and that it can be irrelevant to share what they go through. Respondents D and E said that they would be interested to know other people’s experiences only if there is an urgent need to know or if the conditions are serious. For instance, respondent E elaborated that there is no need to share experiences of having had a cold or headache.

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Respondents were asked for their opinion on having health information presented in different languages. Ten respondents agreed that it was a good idea, especially since Singapore is a multi-racial and multi-lingual country with four main languages of English, Mandarin, Malay and Tamil being used widely. Respondents C, I and J believed that the availability of health information in different languages would allow consumers and patients to access information in a language that they are most comfortable in, and which they can understand better. However, respondent J elaborated that the information must be at a level which consumers and patients can understand, regardless of the language they are presented in. Two respondents (D and E) felt that having health information presented in English is sufficient. Respondent E alleged that most people who are not able to read in English are also not able to read in other languages, although they may speak the language.

6. DISCUSSION AND RECOMMENDATIONS

First of all, it can be safely assumed that most people seek health information through the Internet. They usually go through search engines and trust that the information they obtain would help address their health concerns and needs. People tend to believe that a piece of health information is reliable if it is consistently found in various sources. However, this may not necessarily be the case, as it may be consistently wrong or these sources might have copied the wrong information from other sources, and thus compromises its validity. Hence, efforts must be made to ensure that health information that is authoritative, reliable, current and accurate, is widely accessible. Health information source professionals must be assigned to update health information on the Internet or at least direct consumers or patients to websites where high quality health information can be found [1; 6]. An international medical authority, such as the World Health Organization (WHO), should regularly assess medical websites and provide links to authoritative, accurate and reliable websites. Standards can also be developed to ensure that health information found on the Internet are of high quality [9] so that consumers and patients can automatically gain access to information that is authoritative, reliable, current and accurate. Similarly, doctors and healthcare professionals can also recommend authoritative information sources to their patients.

Secondly, people are quite supportive of the idea of putting forward their health concerns or queries to an online medical expert. However, the credentials and expertise of the expert is paramount. It would also be better if consumers and patients are able to synchronously and asynchronously communicate with the online medical expert, so as to address urgent and non-urgent queries respectively. This is consistent with the findings of Spang and Baker [6], where information professionals and providers
stated that direct support services to consumers seeking health information, rank highest in demand. Extending this, it can be safely assumed that consumers and patients prefer direct contact with healthcare providers to address their immediate health concerns and medical queries.

Next, to facilitate consumers’ and patients’ understanding of medical conditions and ailments, several initiatives can be carried out through the use of IT and the Internet. Online forums, where people can share their experiences of having had various illnesses or ailments would be useful for consumers and patients to compare different medical and health situations. Images and graphics of symptoms of diseases or ailments would also facilitate this [5]. However, the dangers of self-diagnosing must be emphasised so that patients would realise the need to check with their healthcare providers.

Finally, and most importantly, the availability of health information in different languages helps to facilitate understanding [3]. In addition, the availability of health information at different levels of complexity and details is also necessary. Extremely complex health information that is full of medical jargons or oversimplification of health information, both impedes adequate understanding [2; 8]. Hospitals and major healthcare organisations should also provide detailed information about health and medical policies, and major diseases to improve consumer and patient understanding, and prevent misinformation.

7. CONCLUSION

The use of IT and the Internet have been remarkable in disseminating health information and advancing medical knowledge amongst consumers. However, checks and balances must be in place so as to ensure that consumers are able to easily access high quality information and thereafter create useful knowledge to share with others. It is only then that consumers will have absolute faith in the value of IT and the Internet in their lives and well-being.

8. REFERENCES

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