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An Appraisal of Malaysian Hospital Websites as a New Media Tool for Improving Healthcare Information: A Systematic Review

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ABSTRACT

Background: Given that “Hospital websites”, “Healthcare”, “Healthcare systems”, and “Hospital websites as a new media tool” are general terms relating to large amounts of important data, we narrowed our focus to perform a systematic review of Malaysian hospital websites’ presentation of healthcare issues on the basis of “Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)” Our systematic review is applicable to hospital website evaluation, not clinical trials. **Objective:** The main objective of this systematic review was to uncover the findings of previous studies and views on how hospital websites stand as a media tool for healthcare systems. **Results:** Thorough online and offline searching were performed according to the PRISMA criteria. Search results produced 8,268 articles from 11 online databases. The numbers of articles excluded were 2,915 (35%), 3,723 (45%) and 1,511 (18%), on the basis of duplication, focus, and eligibility of not meeting the focus criteria. 119 (2%) full-text articles were assessed as meeting the criteria for how hospital websites can stand as a new media tool for healthcare systems. The results of 44 studies were synthesized. **Conclusion:** Although the results identify current studies on the state of hospital websites, unfortunately the number of published studies on Malaysian hospital websites as of the time of writing was limited, and do not show how Malaysian hospital websites could be used as a new media tool to enhance the healthcare system. This has shed more light on the need to further investigate how Malaysian hospital websites can empower the Malaysian community and its healthcare system.

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INTRODUCTION

In general terms, “website” denotes a complete system and products (Lee and Koubek, 2010). To this end, it represents a collection of well-defined related web pages which resides in a web domain hosted on at least one web server that is easily accessible through the internet. Websites can be categorised by function, as serving commercial, communicative, informative or entertainment purposes (Cebi, 2013), or a combination of two or all of these categories (Camerini and Schulz, 2012). A hospital website serves commercial and/or informational purposes, and should be wholly compliant with the Health on the Net Foundation guidelines (HONcode). The HONcode prescribes guidelines on the quality of the content and overall usability of a web application. Hospital websites can provide information about healthcare-related issues such as the management of illness, provision of medical services, equipment and information for the prevention, diagnosis and treatment of disease, including the services administered by medical practitioners and members of the allied health professions (Häyrinen *et al.*, 2008); they re-engineer healthcare delivery by means of Information Technology (IT). It is important to remember that healthcare issues are part of Malaysia’s Vision 2020’ agenda under a programme called ‘1-Care for 1-Malaysia’ as outlined in the 10th Malaysian Plan 2011-2015 (Cipta, 2007). Currently, the role of Malaysian hospital websites as a means of disseminating information is limited. As a result it is important to investigate the present state of website design and their promotional content of healthcare issues (Dre`ze and Zufryden, 1998; Samoocha *et al.*, 2010) as media tools to enable individuals to navigate and understand the healthcare content, and to identify the processes involved in seeking treatment.

Thus, the aim of the systematic review is to provide new insight into the concept of hospital websites as a media tool, identifying both unnecessary features and those features that end users might value most, to allow the researcher to prioritise some very important aspects of the healthcare system.

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Search Criteria:

Preliminary search terms were proposed by the authors, and then comprehensively evaluated after a first round of searching. The final search terms include “Malaysian healthcare” (MH), “Malaysian hospital websites” (MHW) “Hospital websites” (HW) “Hospital websites as a new media tool” and “Healthcare and websites”. The following online databases were searched: IEEE Xplore™, ACM (Association for Computing Machinery) Digital Library, PubMed, ScienceDirect®, Scopus™, Emerald, SAGE Journals, Taylor & Francis Online, Wiley Online Library, SpringerLink and MEDLINE. The search was refined to articles from 1993 to the present, because 30 April 1993 was the date on which the World Wide Web (WWW) became available to the public. The entire list of retrieved references are similar to the search criteria used by Aaltonen *et al.* (2012).

Search Strategies:

The chosen search terms were used on the entire online databases selected for this study. The search strategies are based on those of Liberati *et al.* (2009), where a reference list of articles found matching the search terms is scanned in order to extract further studies cited in those selected articles. Furthermore, we consulted experts in the field of healthcare-related issues in the Malaysian context, and their presentation on Malaysian hospital websites. Some of the online databases used here are healthcare-related databases, whereas others are the most respected online academic databases providing the highest-quality scholarly articles and conference proceedings. The last search was done on 25 May 2014 as verification of the results of the previous search of 20 January 2014.

Search Process:

Utilising the search criteria and strategies described above, eleven online databases were searched, similar to the study conducted by Aaltonen *et al.* (2012). The search terms were employed in various ways, for example: Malaysian Hospitals Websites*; Malaysian Hospitals Websites; Malaysian Hospitals Websites/; Hospitals Websites*; Hospitals Websites; Hospitals Websites/; Malaysian Healthcare*; Malaysian Healthcare; Malaysian Healthcare/. Specific searches performed on the ScienceDirect® database, one of the most prestigious research databases in Physical, Life and Health Sciences as well as Social Sciences and Humanities, returned the following number of articles: “Malaysian Hospitals Websites*” (no results), “Malaysian Hospitals Websites” and “Malaysian Hospitals Websites/” 270 articles for each. “Hospitals Websites*” retrieved 14 articles, and “Hospitals Websites” and “Hospitals Websites/” each returned 37,513 articles.

Study Selection:

Study selection involved a screening procedure, which commenced by sorting the relevant titles relating to one of this study’s goals, as in the study conducted by Hartling *et al.* (2010). *An Appraisal of Malaysian Hospital Websites as a New Media Tool for Improving Healthcare Information* was the title chosen for this study, so articles were selected on this basis. These articles were further sorted on the basis of their abstracts and conclusions. The titles, abstracts and conclusions generated from the sorted articles were then screened by two independent reviewers in order to determine which matched the study’s goal; the rest were discarded. Thus, the final reviewed articles were those that are relevant to this study.

Data Extraction:

We developed a Microsoft Excel data extraction sheet on which to enter the findings of the sorted relevant studies. They were later piloted in a systematic review, as described in other studies (Liberati *et al.*, 2009; Aaltonen *et al.*, 2012; Hartling *et al.*, 2010). The data extraction sheet was reviewed by two reviewers, as in the study performed by Hartling *et al.* (2010). However, random samples of 15% of data “articles” were selected for extraction by an independent reviewer. The independent reviewer’s extracted data was found to have no significant discrepancies or errors when compared with that of the original two reviewers.

Analysis of the Review:

The systematic review followed the setup guidelines from Liberati *et al.* (2009), although the topic was different. Data integrity was tested to account for possible bias. This was done by two independent reviewers, with data selected from the data extraction sheet. The reviewers rated those data which matched the study goal. Thereafter, the authors reevaluated those selected articles and finally sorted them out.

RESULTS AND DISCUSSION

The flow diagram of the included studies is presented in Figure 1. 8,004 (97%) articles were identified through online database searching, together with 264 (3%) articles through the “search alert” function of the systematic literature search performed on the 11 online databases, making a total of 8,268 records identified and set for screening. 2,915 (35%) articles were identified on the basis of title name as duplicates, and 3,723 (45%) were excluded as not matching the combination of search terms specifically (-media-tool-Malaysian-healthcare-

hospital-websites-) in the title, abstract or conclusions presented in the articles. Although some references excluded did contain the terms we searched on, their views were not focused on our area of hospital websites as a new media tool. 1,511 (18%) articles which matched our area of study were nevertheless excluded base either because they focused on a single aspect of hospital websites as a media tool or hospital website evaluation, but not on healthcare systems related to hospital websites as a media tool. 119 (2%) full-text articles were considered as eligible on the basis of meeting the criteria for healthcare system presentation on related web-based eHealth which is seen as a media tool. Of these 119, 75 full-text articles were excluded as they did not offer criteria for hospital websites as a new media tool; that is, issues related to dissemination of healthcare information on hospital websites was not fully presented. The results from the eligible studies were synthesised: 44 full-text articles in terms of healthcare issues on eHealth and 35 full-text articles indicating the necessity of using hospital websites as a new media tool for healthcare systems (Häyrinen *et al.*, 2008; Cipta, 2007; Aaltonen *et al.*, 2012; Zeng *et al.*, 2009; Varekamp *et al.*, 2006; Anderson, 2007; Huby *et al.*, 2007; Little *et al.*, 2004; Forkner-Dunn, 2003; Powell *et al.*, 2003; Kuijpers *et al.*, 2013; Valaitis, 2005; Salminen *et al.*, 2014; Kononowicz *et al.*, 2014; Pouton and Balasubramanian, 2011; de Jong *et al.*, 2009; Cobb *et al.*, 2014; Ho, 2014; Lai *et al.*, 2014; Samoocha *et al.*, 2009; Samoocha *et al.*, 2011a; Kuijpers *et al.*, 2013; Luger *et al.*, 2014; van Beelen *et al.*, 2014; Vosbergen *et al.*, 2014; Pursey *et al.*, 2014; de Jong *et al.*, 2014; ZamZami *et al.*, 2014; Maher *et al.*, 2014; Samoocha *et al.*, 2011b; Doll *et al.*, 2003; Harris and Veinot, 2004; Eysenbach, 2008; Luo, 2004; Bilsel *et al.*, 2006; Patsioura *et al.*, 2009; Schäfer and Kummer, 2013; Park and Gretzel, 2007; Akincilar and Dagdeviren, 2014; Kim *et al.*, 2006; Zviran *et al.*, 2006; Raji *et al.*, 2013a, 2013b, 2014; Hadwich *et al.*, 2010). Articles by Bilsel *et al.* (2006) and Patsioura *et al.* (2009) evaluated hospital websites with regards to performance, but their findings also showed that hospital websites could stand as a new media tool for healthcare systems. Although many studies were found to be closely related to healthcare issues, within the Malaysian context topics were not related to the presentation and evaluation of hospital websites as a new media tool for health-related issues.

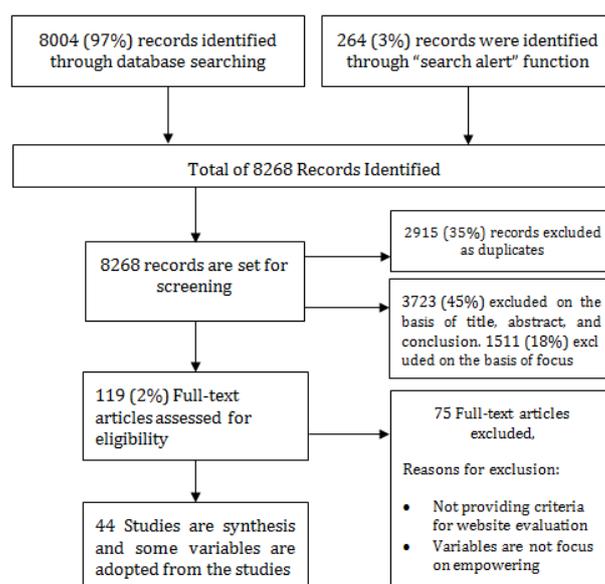


Fig. 1: Flow diagram of included studies.

Findings:

This study aimed to evaluate studies on Malaysian hospital websites. Unfortunately, no article was identified that focused on Malaysian hospital websites, although other findings were collected, summarised in Table 1.

Table 1: Summary of the major finding from the systematic review.

Reference	Principal Findings
Häyrinen <i>et al.</i> (2007)	"Functional interactivity of web-based eHealth had no impact on information delivery" but there is a strong impact of knowledge on health outcomes
Kuijpers <i>et al.</i> (2013)	The requirements for an interactive web portal to empower breast and lung cancer survivors include features that indicate "information provision by means of a survivorship care plan and interactivity by providing feedback on patient-reported outcomes" on websites
Valaitis (2005)	"Youth perceived computers and the Internet to be empowering tools, and they should be encouraged to use such technology to support them in community initiatives"
van Uden Kraan (2008)	"Participation in an online support group had the same profound effect on lurkers' self-reported feelings of being empowered in several areas "

Samoocha (2009)	"The physician-patient relationship may be enhanced and claimants' satisfaction and perceived justice can be improved through web-based".
Samoocha (2011a)	Intervention of web-based systems to increase levels of empowerment among disability claimants, prior to the assessment of disability was not successful
Maher <i>et al.</i> (2014)	Satisfaction with the web-based intervention was high
Doll <i>et al.</i> (2003)	Informed and empowered patients take better care of their health

Conclusion:

While The objective of this study was to evaluate Malaysian hospital websites on the basis of related/previous research carried out and published. However, no article was identified that focused on Malaysian hospital websites related to considerations of being a new media tool for enhancing the healthcare system. Systematic review findings on 8,268 articles retrieved from 11 online databases produced 44 full-text articles after exclusion. 35 full-text articles were found to be eligible for synthesis of hospital websites as a new medium for enhancing healthcare system on healthcare issues by eHealth application. Other articles on website evaluation were also considered. The review also produced articles illustrating how hospital websites could not only stand as a new medium for health system, but also as an empowerment tool (Thomas and Velthouse, 1990) on eHealth related issues. The combination of articles on website evaluation, empowerment on healthcare in eHealth applications and hospital websites as a new medium for enhancing healthcare systems demonstrated the need for implementation. This study recommends that hospital websites should not be just a medium for commercialisation. Many more advantages can be found, particularly as the number of internet users is increasing. The core is using it as a new media tool to enhance healthcare systems.

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