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Developing Methods to Evaluate Content Quality of Dementia Websites

Yunshu ZHU[a], Ting SONG[a,b] and Ping YU[a,b,1]
[a] *Centre for Digital Transformation, School of Computing and Information Technology, Faculty of Engineering and Information Sciences, University of Wollongong, Wollongong, Australia*
[b] *Illawarra Health and Medical Research Institute, University of Wollongong*

Abstract. With the popularity of the Internet, consumers are likely to resort to websites for dementia information. However, they may not have the knowledge or experience in distinguishing quality information from opinion pieces. This study investigated the developing methods, instruments and parameters for evaluating the content quality of dementia websites. By reviewing 18 existing instruments from the relevant literature, we identified four developing methods – questionnaire survey, automatic evaluation, Delphi method and focus group discussion. These instruments include six parameters – reliability, currency, readability, disclosure, objectivity and relevance – to evaluate the content quality. With the significant social and economic impact of dementia, developing specific instruments to measure the content quality of dementia websites is necessary.

Keywords. Health information, dementia, websites, method, evaluation, quality

1. Introduction

Dementia is one of the leading causes of global mortality and mortality. As it significantly impedes a person's cognition, behaviour and ability to perform daily living activities, dementia is overwhelming for patients and their caregivers, family members or paid care workers alike [1]. As there is no cure for the disease nor treatment that can alter its progression, significant investments in public campaigns and education about dementia have been undertaken by countries [2]. Although healthcare professionals are the most common and reliable source of dementia information, they are not always readily accessible. Therefore, dementia websites are also the major source of information about dementia and dementia care for the general public [3,4]. As a result, it has seen the booming of dementia websites all around the world.

With a substantial amount of dementia information being made available on the websites, the general public, who may not have adequate health information literacy or web search skill, to access and distinguish quality information from opinion pieces on dementia websites. Poor-quality information can lead to wrong healthcare decision making that could harm patient safety. If wrong information were used to guide dementia care, patients would suffer unnecessary distress, such as agitation. It may also negatively

[1] Corresponding Author, Ping Yu, Centre for Digital Transformation, School of Computing and Information Technology, Faculty of Engineering and Information Sciences, University of Wollongong, Wollongong, 2500, NSW, Australia; E-mail: ping@uow.edu.au.

impact the physician-patient relationship [5]. In response to this significant societal need for quality dementia and dementia care information, this study addressed two questions:

- Q1. What parameters were used to evaluate the content quality of the dementia websites?
- Q2. How were these parameters evaluated, using which methods, procedures and instruments?

2. Methods

A scoping review was conducted by searching six databases (PubMed, PMC, CINAHL, MEDLINE, Web of Science and Scopus) with five keywords: "health" AND "method*" AND "evaluat*" AND "quality" AND "websit*" ("*" referred to a wildcard). Papers reporting the methods for evaluating the quality of health websites between 2009 and 2019 were included. All search results were exported to an Endnote library and screened by two reviewers independently. Data extracted included the measurement parameters, measurement methods, instruments and evaluation processes. For each paper, one reviewer read the full text and extracted the needed information. A second reviewer validated the data extracted to ensure reliability and validity. Disagreements were resolved by consensus [7].

3. Results

Twenty-one studies were reviewed [6-8,10-27]. Six parameters to evaluate the content quality of dementia websites were identified. In descending order of frequency of use, they were: reliability (21/21) [6-8,10-27], currency (21/21) [6-8,10-27], disclosure (12/21) [10,13,15,16,18, 20-24, 26, 27], readability (11/21) [9-16,19,20,26], objectivity (9/21) [6,7,10,12,16-18,20,22] and relevance (6/21) [6,7,16,19,20,25] (see Table 1).

Four methods – questionnaire survey, automatic evaluation, Delphi method, and focus group discussion, were identified to develop an instrument. The questionnaire survey was the most commonly used method (18/21) [9-24,26,27]. It was independently answered by two to five health professionals/health students. The difference between the evaluations was resolved through discussion and consensus. For example, DISCERN is a brief questionnaire for health consumers to assess the quality of written information, specifically the completeness of treatment choices for a health problem. The next commonly used method is automatic evaluation (9/21) [9-16,18], such as Flesch–Kincaid Grade Level (FKGL) and Flesch Reading Ease (FRE) Scale. When using this method to evaluate the content of a health website, a person needs to manually copy the text on the website and past it into a software application, which will automatically calculate and display the score for this text corpus according to the calculation result of a certain algorithm. Another example was HON code provided by Health On the Net Foundation [28]. It has eight principles to guide consumers to evaluate the quality of health websites (authority, complementarity, confidentiality, attribution, justifiability, transparency, financial disclosure and advertising). The Delphi method was used by Leite et al. in Portugal [7] to identify the most common parameters and their respective weights for measuring the content quality of health websites. Tao et al. [25] used focus group discussion to identify quality parameters of health websites.

Table 1. Evaluation parameters, definition, methods and corresponding instrument of health websites.

Parameter	Definition	Method	Instrument
Reliability	A reliable website should contain references from published or unpublished resources [13,17].	1. Focus group [25] 2. Questionnaire survey [8,16,23,25,26] 3. Delphi Method [6,7] 4. Automatic [10,16,18]	1. Interview and quality assessment [8, 25] 2. DISCERN [29], Checklist [23] 3. Questionnaire [6, 7] 4. HONcode [28]
Currency	The websites should include the 'create date' and 'last updated' and up to date [8-10].	1. Questionnaire survey [8,10-12,14-19,21-24,27] 2. Delphi Method [6,7]	1. EQIP, JAMA Benchmarks, DISCERN, HRWEF [30], QCSS [31], QUEST [22], DARTS [32], eHealth code, Survey [8] 2. Checklist 3. Questionnaire
Disclosure	Authorship, sponsorship, advertising, potential conflicts of interest should be fully disclosed [9,10,20].	Questionnaire survey [15,21-23, 26,27] Automatic evaluation [10,16,18]	1. eHealth code [33], EQIP [26] JAMA Benchmarks [34], QCSS, QUEST, DARTS, Checklist 2. HONcode
Readability	The information on the websites should be clear and easy to understand [10,12,13,19].	1. Focus group [25] 2. Questionnaire survey [15,26] 3. Delphi Method 4. Automatic [9-15,19]	1. Interview and quality assessment 2. HRWEF, eHealth code, EQIP 3. Questionnaire 4. FRES, FKGL, SMOG
Objectivity	The fact should not be influenced by personal feelings. The claim should be the whole [41].	1. Questionnaire survey [10-12,14-19,21,22,24,27] 2. Automatic [10,16,18]	1. DISCERN, QUEST, eHealth code, Questionnaire [6] 2. HONcode
Relevance	Content scope and information support should provide suite users' needs.	1. Focus group [25] 2. Questionnaire survey [10-12,14-19,21,22,24, 7] 3. Delphi Method [6,7]	1. Interview and quality assessment 2. eHealth code, HRWEF, eHealth code, EQIP 3. Questionnaire

eHealth code: e-Health Code of Ethics; EQIP: Ensuring Quality Information for Patients; QCSS: Quality Component Scoring System; QUEST, Quality Evaluation Scoring Tool; DARTS, Author, Reference, Type and Sponsor; HONcode, The Health On the Net Code; HRWEF, Health-Related Website Evaluation Form; FRES, Flesch Reading Ease Score; FKGL, Flesch–Kincaid Grade Level; SMOG, Simple Measure of Gobbledygook

4. Discussion

This review identified and analysed four methods, six parameters and 18 instruments used by previous researchers in measuring the content quality of health/dementia websites. A questionnaire survey is the most commonly used one among the four evaluation methods. Among all the automatic evaluation methods, only HON providing a comprehensive assessment of the quality, and the other only assessed the readability of health websites. There is a lack of a specific automatic instrument to assess the content quality. For the Delphi method, 30 members participated in the evaluating processes with two or three rounds, including health care professionals, websites designers, university professors and students whose research is involved in the health field. This method evaluates four parameters: reliability, currency, readability, and relevance information on the websites. It is a significant method to provide a high-quality evaluation of websites, linking existing knowledge of agreement or disagreement. The focus group was only conducted in one study, providing a comprehensive assessment to the students in the health and business domain. It provides an initial step for developing criteria to evaluate health websites from consumer perspectives. However, it is only within a certain age group and lacks potential health care consumers in various backgrounds.

The study also revealed that the instruments were generic, not specific for measuring dementia websites. In addition, these instruments used different scoring scales, such as yes/partly/no tick boxes [26] and 3- or 5- point Likert scales [10-12,14,16-19,21,24,27], making it difficult to compare the evaluation results.

This study contributes to developing nursing informatics methods. Its usefulness for nursing informatics is manifested in two aspects. First, the research topic is in the scope of nursing practice in gathering rigorous information about dementia and dementia care for own professional development and patient education. Second, the methods identified are useful to guide nurses in developing dementia and other health websites.

The limitation of this study is the inclusion of evaluation methods for the content quality of health websites. The lack of adequate studies specifically targeted the content quality of dementia websites led to the identification of two evaluation methods - Delphi and focus group discussion – as evaluation methods for dementia websites. This is not accurate as these two types of studies only developed quality parameters for the content quality of generic health websites. However, as dementia websites is a type of health website, the findings from these two types of studies are relevant.

5. Conclusions

This review identified six parameters for evaluating the content quality of dementia websites: reliability, currency, disclosure, readability, objectivity and relevance. Four methods were used to evaluate these quality parameters: questionnaire survey, automatic software evaluation, Delphi methods and focus group discussion. However, due to a lack of specific measurement instruments to evaluate the content quality of dementia websites, future research should focus on developing such specific measurement instruments.

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