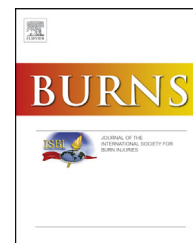


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Inaccurate, inadequate and inconsistent: A content analysis of burn first aid information online

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ABSTRACT

Objective: With the popularity of the Internet as a primary source of health-related information, the aim of this website content analysis was to assess the accuracy and quality of burn first aid information available on the Internet.

Methods: Using the search term 'burn first aid' in four popular search engines, the first 10 websites from each search engine were recorded. From a total of 40 websites recorded, 14 websites were evaluated after removing duplicates. Websites were assessed on content accuracy by four independent reviewers with checks conducted on inter-rater reliability. Website quality was recorded based on Health on the Net Code of Conduct (HONcode) principles.

Results: Country of origin for the 14 websites was the US (7), Australia (6), and New Zealand (1). The mean content accuracy score was 5.6 out of 10. The mean website quality score was 6.6 out of 12. Australasian websites scored lower for quality but higher for accuracy. The US websites scored higher for quality than accuracy. Website usability and accuracy in a crisis situation were also assessed. The median crisis usability score was 3 out of five, and the median crisis accuracy score was 3.5 out of five.

Conclusions: The inaccurate and inconsistent burn first aid treatments that appear online are reflected in the often-incorrect burn first aid treatments seen in patients attending emergency departments. Global consistency in burn first aid information is needed to avoid confusion by members of the public.

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1. Introduction

Burns are the fifth leading cause of non-fatal childhood injuries globally [1], with children aged 0-4 years having the highest incidence of burns [2,3]. The impact of burns includes symptoms such as pain and itch that may continue for years [4], as well as a socioeconomic and treatment burden on the child, their family and the healthcare system [5].

High quality evidence indicates the correct application of first aid after a burn improves wound healing [6-12]. Unfortunately, there is poor use and low knowledge of correct burn first aid in the general public [13-18]. Burn first aid treatment incorporates four principles: removing clothing and jewelry from the burn area, applying cool running water, covering the wound with cling film or a clean cloth, and seeking medical help. These elements are included in the burn first aid recommendations of the majority of burn advisory agencies globally [11,18]. However, the recommended duration of water cooling time is inconsistent between these agencies despite growing evidence that 20min of cooling time is optimal [7,12,19,20].

The Internet is a popular source of health information, with Google reporting 20% of all searches being health-related [21]. It is common for parents of young children to use the Internet to seek medical advice, often before seeking advice from a healthcare professional [22,23]. Although there is an abundance of health information available online the accuracy of the information is reported to be low [24-26]. One study, a decade ago, that specifically examined burn first aid information online found only a small portion of sites had accurate information [27]. A decade is an exceptionally long time with respect to the immediacy of the information provided on the Internet.

Given the popularity of the Internet as a source of health information by parents of young children and the high incidence of burns in this population, the accuracy of burn first aid information available on the Internet needs to be evaluated, particularly its use in a crisis situation. This study aimed to evaluate the content accuracy and website quality (based on accessibility/usability, credibility and currency) of websites returned from the search term 'burn first aid'.

2. Method

2.1. Study design

Website content analysis.

2.2. Website selection

As there is no validated tool for website sampling for research purposes [28], the websites included were identified by entering 'burn first aid' into four popular search engines: Google, Yahoo, Bing, and Ask.com on June 3, 2015. To ensure a 'clean' search, the computer's cache was emptied and all browsing history was deleted prior to the searches. No geographical settings were used.

The first 10 websites appearing on the first page of each search engine were recorded. Research shows most web users do not look beyond the first page of search results [29]. Sites that focused on general first aid and health information were included if pages or sections specifically addressed burn first aid.

2.3. Evaluation procedure

Two primary evaluation areas were included: content accuracy and website quality. Content accuracy was assessed by rating the site's adherence to the basic principles of burn first aid: stop, remove, cool, cover and seek [30]. Website quality (accessibility/usability, source credibility, and currency) was based on criteria developed by Hoffman-Goetz and Clarke [26], and on Health on the Net Code of Conduct (HONcode) principles [31]. Determining the website quality involves assessing the same factors that readers of print publications depend on: authorship of content, attribution to the sources of content, disclosure of funding and competing interests, and timeliness of information presented [32]. Readability was assessed using the Flesch-Kincaid Grade Readability score [33].

Assessment was divided into subjective items relating to accuracy of burn first aid information, which was reviewed by four independent reviewers (JB, LC, ZT, RK) and objective items for website quality, which were recorded by one reviewer (JB). Inter-rater reliability was determined using Intraclass Correlation Coefficients (ICCs). An ICC value greater than 0.7 is recommended as an acceptable standard for reliability [34].

Two scoring systems were developed by the authors, one for content accuracy and the other for website quality. The content accuracy score ranged from 0 to 10 (e.g. 0=poor accuracy, 10=excellent accuracy). The accuracy score breakdown is shown in Table 1. The website quality score ranged from 0 to 12 (see score breakdown in Table 2). Website quality and accuracy scores were also analyzed in two groups based on their country (area) of origin: the US and Australasia. A Z-test was used to assess differences in proportion of mean scores between geographic website groupings.

Included websites were also rated for usability and accuracy in a crisis situation on a Likert scale of 0-5 (0=poor usability/accuracy, 5=excellent usability/accuracy) by four reviewers (JB, LC, ZT, RK). Crisis usability scores were based on how quickly burn first aid information could be found on the website (within 2-3 clicks of the mouse), how easy the information was to understand, if the website provided illustrations to explain the first aid instructions, and if easy to identify step-by-step instructions were provided. Crisis accuracy scores were based on the websites inclusion of the four burn first aid principles (remove, cool, cover and seek) as well as information about different burn types and severities.

3. Results

The website searches returned a total of more than 94 million results. The first 10 websites from the four search engines were recorded. Of those, 14 websites were included after removing duplicates. The country of origin of the included sites were the US (7), Australia (6) and New Zealand (1). The websites with the highest-ranking page order on all four search engines were

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