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Original Article

Evaluation of the quality and reliability of internet information on fissure sealants using JAMA benchmark and HONcode seal

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Abstract

Background: The internet is an important tool; however, there are concerns about the quality and reliability of medical information available online. This study aimed to evaluate the quality and reliability of internet information on fissure sealants with different toolkits.

Methods: This study was conducted by searching the internet using the Google search engine with questions about fissure sealants. The first thirty websites in search results for each question were evaluated. Videos, duplicate websites, and advertisements were excluded. A total of 270 websites were evaluated by the *Journal of American Medical Association* (JAMA) Benchmark and Health on the Net Code of Conduct (HONcode) certification.

Results: The results revealed that 35.1% of the websites met JAMA authorship criteria, 19.3% met JAMA attribution criteria, 42.1% met JAMA disclosure criteria, and 19.3% of websites met JAMA currency criteria. The websites from the United States and Australian websites showed the highest JAMA authorship criteria scores, respectively. Moreover, 8.8% of websites met HONcode criteria. One information, two government, and two organization websites met the criteria of this certification. None of the private clinic websites met HONcode criteria.

Conclusion: This study showed that the quality and the reliability of web-based information on fissure sealants in pediatric patients are generally inadequate. Both physicians and website editors should be careful and attentive when sharing information on the Internet.

Keywords: Pit and Fissure Sealants, Health, Internet

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Introduction

Fissure sealants are regarded as the effective preventive means to protect fissures from caries (1,2) and prevent incipient decay. Numerous clinical studies and systematic reviews reported that fissure sealants prevent occlusal decay (3,4). Fissure sealants prevent accumulation of food in fissures which are prone to decay but most of the people are not aware of this.

The internet is used as a source of health information for parents (5). Health knowledge on the Internet is controversial recently (6,7) and it needs to be controlled and regulated as asserted in the literature. There are different toolkits to assess health information on websites such as the *Journal of American Medical Association* (JAMA) benchmark criteria (8). Silberg et al described the JAMA benchmark and its four criteria including authorship, attribution, disclosure, and currency as:

Authorship: Contributors and their affiliations should be explained on websites.

Attribution: References and copyright information should be mentioned.

Disclosure: Websites should disclose conflicts of interest, financing, advertising, and ownership information.

Currency: Websites should specify the date and the updates of the information.

The other toolkit used to evaluate the reliability and credibility of the websites information was the Health on the Net Code of Conduct (HONcode) (9). The HONcode certification evaluates the quality of health information of websites annually. The reliability of the data is evaluated based on eight criteria: authority, transparency, attribution, justifiability, confidentiality, financial disclosure, advertising, and complementarity.

This study aimed to evaluate the quality and reliability of internet information on fissure sealants in children using the JAMA Benchmark and the HONcode seal.

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Methods

The present study was an analytical cross-sectional one. The internet search was performed in this study using Google search engine, in English. The keywords were created by asking parents experiencing dental treatment. A total of 9 keywords were identified as follows:

- Fissure sealants
- What are fissure sealants?
- What is the purpose of fissure sealants?
- Are fissure sealants necessary?
- Is fissure sealant a filling material?
- Dental fissure sealants
- Child fissure sealants
- Dental fissure sealants materials
- Pit and Fissure Sealants

Each keyword was searched in the search engine and only English websites were evaluated. The first 30 websites for each keyword were evaluated. A total of 270 websites were assessed with 9 keywords. The websites of private clinics as well as information, official, and organization websites were included in the study. Advertisements, research papers, videos, and duplicate websites were excluded. One researcher, a pediatric dentist (B.K), evaluated all websites.

The websites were evaluated using the JAMA benchmark and the HONcode seal. The four criteria of the JAMA benchmark (authorship, attribution, disclosure, and currency) were evaluated as present or absent on the websites. The presence or absence of the HONcode criteria was also assessed on the websites.

Data were analyzed using SPSS statistical software (version 18, SPSS Inc. IBM, Chicago, IL). The frequency was analyzed via descriptive statistics and the categorical variables were evaluated using the chi-square test. The statistical significance level was set at $P<0.05$.

Results

A total of 57 out of 270 websites met the evaluation criteria. The websites of 41 private clinics as well as 5 information, 4 government, and 7 organization websites were evaluated from 03/03/2021 to 14/03/2021.

The highest number of links provided by the Google search was for "What are fissure sealants?" (2.370.000 results) and the lowest number was for "Dental fissure sealants materials" (495.000 results). The keywords searched on the web and the approximate number of results are shown in Table 1.

The results indicated that 20 (35.1%) websites met authorship criteria, 11 (19.3%) websites met attribution criteria, 24 (42.1%) websites met disclosure criteria, and 11 (19.3%) websites met currency criteria of the JAMA benchmark. In 16 websites, none of the JAMA benchmark criteria were observed. Only 1 of the websites met all JAMA criteria. The results of the comparison of frequency scores of JAMA criteria by type of website are shown in Table 2.

The evaluation of the websites by JAMA criteria based on the type of website showed there was no statistically significant difference between the websites in the authorship and disclosure criteria ($P>0.05$). However, there was a statistically significant difference between the websites in currency and attribution criteria ($P<0.05$). Private clinic websites were found to have higher attribution scores than other websites and the organization websites had the lowest attribution scores. Moreover, there was a statistically significant difference between private clinic websites and information websites

Table 1 The keywords searched on the web and the approximate number of results

Keywords searched on the web	Number of results
Fissure sealants	750000
What are fissure sealants?	2370000
What is the purpose of fissure sealants?	2070000
Are fissure sealants necessary?	673000
Is fissure sealant a filling material?	659000
Dental fissure sealants	1460000
Child fissure sealants	777000
Dental fissure sealants materials	495000
Pit and fissure sealants	869000

Table 2 Comparison of frequency scores of JAMA and HONcode criteria by type of website (%)

Criteria	Frequency (Total) (%/number)	Type of website	Frequency (%/number)	*P*
Authorship (JAMA)	35.1 (20)	Private Clinic	21.1 (12)	0.135
		Information	7. (4)	
		Government	3.5 (2)	
		Organization	3.5 (2)	
Attribution (JAMA)	19.3 (11)	Private Clinic	8.8 (5)	0.027*
		Information	5.3 (3)	
		Government	3.5 (2)	
		Organization	1.8 (1)	
Disclosure (JAMA)	42.1 (24)	Private Clinic	26.3 (15)	0.589
		Information	5.3 (3)	
		Government	3.5 (2)	
		Organization	7.0 (4)	
Currency (JAMA)	19.3 (11)	Private Clinic	8.8 (5)	0.027*
		Information	5.3 (3)	
		Government	3.5 (2)	
		Organization	1.8 (1)	
HONcode Seal	8.8(5)	Private Clinic	0.0(0)	0.001*
		Information	20.0(1)	
		Government	50.0(2)	
		Organization	28.6(2)	

Chi-square test: * $P<.05$ significant difference between the groups (type of website).

in attribution scores ($P<0.05$). There was a statistically significant difference between private clinic websites and government websites in attribution scores ($P<0.05$).

Private clinic websites showed higher JAMA currency scores than other websites. There was a statistically significant difference between private clinic websites and government websites in currency scores ($P<0.05$).

The assessment of the websites by JAMA criteria based on country revealed there was no statistically significant difference between the websites ($P>0.05$). However, the websites from the USA met the highest authorship criteria scores followed by the Australian websites. The results of the comparison of frequency scores of JAMA criteria by country are shown in Table 3.

Only 5 (8.8%) websites met the HONcode criteria. The distribution of HONcode-certified websites by country is shown in Figure 1.

One website from the UK, one website from the USA, and two websites from the Australia were HONcode-certified. Evaluation of the certified websites according to the type of the website demonstrated that one information, two government, and two organization websites were HONcode-certified (Figure 2).

Table 3. Comparison of frequency scores of JAMA criteria according to country (%)

Country	Authorship (JAMA)	Attribution (JAMA)	Disclosure (JAMA)	Currency (JAMA)
Australia	10.5	5.3	10.5	3.5
Canada	0.0	0.0	0.0	0.0
Germany	1.8	1.8	1.8	1.8
Ireland	0.0	0.0	0.0	0.0
Malaysia	1.8	0.0	1.8	1.8
New Zealand	0.0	0.0	1.8	1.8
Russia	0.0	0.0	0.0	0.0
Scotland	0.0	0.0	0.0	0.0
Turkey	1.8	0.0	0.0	0.0
United Kingdom	3.5	1.8	17.5	5.3
United State	15.8	10.5	8.8	5.3
P	0.058	0.098	0.487	0.612

Chi-square test: $P<0.05$ significant difference between the countries

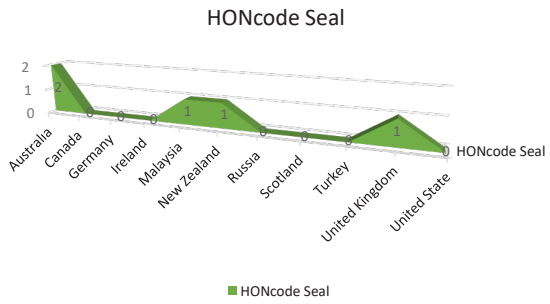

Figure 1. Distribution of HONCode-certified websites by country

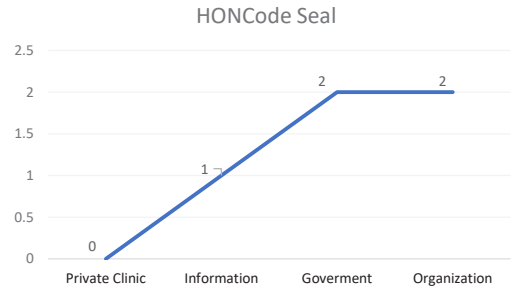

Figure 2. Distribution of HONCode-certified websites by website type

Discussion

This is the first study to evaluate the quality and reliability of web-based information related to fissure sealants using two different scales. The results showed that both the quality and the reliability of Internet information were inadequate. Most of the websites did not meet all JAMA benchmark and HONcode certification criteria. Since similar studies were not found, the results of the present study were discussed with studies on different health issues.

It has been reported that patients use the Internet to gain information before visiting a doctor (10). It is essential to improve the medical information on the Internet since most patients need additional information on their illness to understand their complications better. However, Internet users should be cautious about whether information on the Internet is appropriate and reliable (5).

To evaluate the quality of the websites in this study, accuracy and disclosure were of paramount importance ([11]) and then, confidentiality and safety were given priority in the second place. JAMA benchmark and HONcode seal were utilized to evaluate the web-based medical information on fissure sealants in this study. Both these toolkits evaluate the websites without relying on the evaluator's knowledge.

The websites containing information about inflammatory bowel disease were of poor quality. Internet users reported having trouble understanding them (12). Zhang et al stated that the information on laparoscopic gastrectomy in the websites was appropriate (13). Alakhali also reported that the quality of web-based information regarding oral cancer was inadequate (14) Furthermore, it was shown that the information on websites regarding endotracheal intubation was sufficient (15). It was reported in another study that the quality and the reliability of website information on lingual orthodontics were low (16). The website information on prognosis and treatment was also found insufficient (5). The website information on peri-implantitis was also of low quality (17). Another study reported that JAMA scores were lower than expected (18). Corcelles et al also reported similar results (19). Rothrock et al stated that

the reliability of the web-based information regarding acute pediatric complaints was not sufficient (20). These results were in line with the results of the present study suggesting that the quality and reliability of internet information on fissure sealants were inadequate.

Olkun et al reported that attribution and currency criteria scores were lower than the other criteria, and the authorship criteria score was the highest in the websites searched (16). Alakhali stated that JAMA currency criteria score was the highest and JAMA attribution criteria score was the lowest among the analyzed websites (14). In the present study, disclosure criteria was the highest and JAMA attribution and JAMA currency criteria were similar and lower than the other JAMA criteria. Besides, in the study by Alakhali, there were only two websites that met all four JAMA Benchmark criteria, and 13 websites did not meet any of the JAMA criteria (14). This study indicated that 16 websites did not meet any JAMA Benchmark criteria and only one of the websites met all JAMA criteria. It was found that private clinic websites had higher attribution and currency scores than the others, and this difference was statistically significant. However, the organization websites had lower JAMA attribution and JAMA currency scores than the others. The websites of the USA met higher JAMA authorship and attribution scores than those of the other countries in this study. The websites in the Australia followed it. Websites of Ireland, Scotland, and Canada did not meet any JAMA scores.

The results of a study on web-based information about sleeve gastrectomy showed that a few websites (4%) met the HONcode criteria (18). However, 49 websites on acute pediatric complaints met the HONcode criteria (20). Five websites met HONcode criteria for web-based information on fissure sealants in this study. Furthermore, 2 Australian websites, 1 Malaysian website, 1 New Zealand website, and 1 website from the United Kingdom met the HONcode certification criteria. None of the websites of the private clinics met the HONcode certification criteria. Two organization, two government, and one information websites met the HONcode certification criteria.

One of the limitations of this study was that although English is widely used on the Internet, information on fissure sealants was rare on English websites and web-based information on fissure sealants in pediatric patients was limited.

Conclusion

The quality and reliability of web-based health information are of considerable importance. Nowadays, all patients primarily search for information about their ailments on the Internet. Both physicians and website editors should be careful and attentive to the information shared on the Internet. This study showed that both the quality and the reliability of the web-based information on fissure sealants in pediatric patients were generally inadequate. Thus, further studies are required to provide reliable and quality medical internet information.

Author's Contribution

BK designed and implemented the research, analyzed data, and wrote the manuscript.

Conflict of Interests

Nothing to declare.

Financial Disclosure

Nothing to declare.

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