Quality evaluation of websites with information on childhood dental caries in Portuguese language

Avaliação da qualidade dos sítios da internet com informação de cárie na criança em língua Portuguesa

Abstract

Purpose: The purpose of this research was to assess the websites retrievable on an Internet search engine, with childhood dental caries information, available for the Portuguese speaking population, and also evaluate the quality of its information.

Methods: The search engine selected was Google®, with key words "*Cárie*" AND "*Criança*". The first 100 search results were assessed. Quality evaluation of the websites was performed by using the Health of the Net Foundation (HON) website.

Results: Scientific papers, in .pdf format were the most retrievable URL (n=25), followed by health portals (n=14). Brazilian domains (.BR e .GOV.BR) were the most prevalent (n=73). Portuguese domain (.PT) was present in only 4 websites URL. Concerning the quality evaluation, only 5.3% of the websites retrieved had the HON Accreditation.

Conclusion: Although caries is the most common childhood disease, there seems to be a lack of quality on this theme information in Portuguese language, available for these oral health-consumers on the WWW.

Key words: Childhood dental caries; internet; oral-health information

Resumo

Objetivo: O objetivo desta investigação foi analisar os resultados de uma pesquisa num motor de busca relacionada com o tema da cárie dentária na criança disponíveis para a população falante de língua Portuguesa, e também avaliar a qualidade dessa informação.

Metodologia: O motor de busca selecionado foi o Google®, com as palavras chave "Cárie" e "Criança". Os primeiros 100 resultados da pesquisa foram analisados e foi efetuada uma avaliação da qualidade dos mesmo utilizando o sítio da Internet da "Health of the Net Foundation" (HON).

Resultados: Os resultados mais obtidos nesta pesquisa foram artigos científicos em formato .pdf (n=25) e portais de saúde (n=14). Os domínios brasileiros (.BR e .GOV.BR) foram os mais prevalentes (n=73). O domínio Português (.PT) apenas foi encontrado em 4 sítios da Internet. Relativamente à avaliação da qualidade, somente 5,3% dos sítios da Internet que resultaram da pesquisa tinham a acreditação da HON.

Conclusão: Apesar de a cárie ser a doença mais prevalente nas crianças, parece haver uma falta de qualidade da informação disponível em língua Portuguesa relacionada com este tema, para os consumidores de informação de saúde oral na WWW.

Palavras-chave: Cárie dentária; criança; internet; informação de saúde ao consumidor

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Introduction

Dental caries is the most common childhood disease being, as an example, five times more prevalent than asthma (1). Although, this disease is under control in developed countries with prevention methods and also treatment options, it is still a major concern among parents and educators, due mainly to a sugar-rich diet (2).

The DMFT (decay, missed and filling tooth) index stated on the WHO (3) for the countries included in the CPLP (Community of Portuguese Language Countries): Portugal, Brasil, Angola, Mozambique, Cabo Verde, Guiné-Bissau, São Tomé e Príncipe and Timor-Leste (4); the WHO data are dispayed on Table 1, and for most of the countries must be urgently updated (*e.g.*, Angola, Mozambique, Guine Bissau and Cape Verde), or even done for the first time, as in the case of São Tomé and Principe and East Timor.

Table 1. DMFT index for the CPLP countries stated in the WHO.

Country	DMFT (12 years old)	Year
Portugal	1.5	1999
Brazil	2.8	2002-03
Angola	1.7	1981
Cape Verde	2.8	1989
Guine Bissau	0.5	1986
Mozambique	0.6-5.5	1983
São Tomé and Principe	No data	No data
East Timor	No data	No data

Brazil has the latest data, from 2002-03, stated in a Report from the Health Minister (5), with deft/DMFT values of 2.8 in the age groups of 5 and 12 years old (Table 2).

Table 2. deft/DMFT index in Brazil, in different age groups.

Age group	Caries prevalence in Brazil	Year
18-36 months	deft = 1.1 (decay = 1.04)	
5 years old	deft = 2.8 (decay = 2.4)	2002-2003
12 years old	DMFT = 2.8 (decay = 1.7)	

If oral hygiene is well performed and the sugar-rich diet is controlled, the tooth decay risk is reduced. Otherwise, there are different prevention and treatment approaches (*e.g.*, fluoride gels, pit-and-fissure sealants) that can be used to avoid/treat the caries lesion (2,6,7). However, oral health promotion and education is still the most adequate way to avoid dental caries among children. Nowadays, Internet plays an important role in health promotion and education, since it has a great potential to disseminate information to a large part of the population, especially in western nations where Internet has a high penetration rate (*e.g.*, Brazil: 37.8% penetration rate = 75,943,600 people. It represents 48.5% of users in South America) (8-10).

Many individuals take responsibility for their own health, doctors are no longer the sole holders of health knowledge (11), and online health seeking is a reality, reaching values of 80% in the USA (12) and 52.3% in Europe (13). Eysenbach (14) states that a minimum of 6.75 million health-related searches are done everyday.

As other child diseases, dental caries may also be object of a web-search to get more knowledge about the etiology of the problem, the ways to prevent it, and the ways to treat it when it is already installed. Concerning specifically dental information, some studies (12,15) found that 15%-16.7% of the health-information seekers searched specifically oral-health information on the www, which is an important mark about the impact that this issue has on the population.

Most of the web-searches start by a search engine rather than a specific health-related website (12). Actually, the most used web-search engine is Google®, with 65.1% of the market share (16). However, although an high percentage of the population search for health-related issues, about 75% do not consistently check the source and the date of the health information that they find online (12), which may represent a major concern on a public health issue (9).

Quality evaluation of a website can be performed by identifying some principles, like Authority, Mission, Privacy, References, Justification of claims, Contact Details and Disclosures, among others (9,10). These criteria have been provided by some organizations/councils like the eEurope 2002 (17), or the Health on the Net Foundation, a non-profit, non-governmental organization, created in 1995, and accredited to the Economic and Social Council of the United Nations, that offers a multi-stakeholder consensus on standards to protect citizens from misleading health information (18).

Regarding language preferences on websites, although two thirds of the web-pages on the WWW are in English, there are 700 million non-English speakers internet users (19,20). Portuguese, for example, is one of the major languages in the world, ranked 7th with almost 240 million speakers, distributed by the countries of the CPLP and others 29 countries where there exists a Portuguese speaking population (19,20). As so, it is presumed that Portuguese plays also an important role on these health-related web-searches. According to Singh (21), most of the world's people appear to be searching health information in their local language, or mother language, and not in English. This author (21) concludes that a major effort and investments should be done in translations and cross-language search retrieval by online search engines into the world's most important linguistic groups (*e.g.*, Chinese, Hindi, Spanish, Arabic, Portuguese, Bengali, Russian).

The purpose of this research was to assess the websites retrieved on an Internet search engine with dental caries information, available for the Portuguese speaking population, and also evaluates the quality of its information.

Material and Methods

To perform a web search about childhood dental caries, the search engine selected was Google®. Besides being the most used web-search engine in the WWW (16), Google was also used in another study about the internet-derived patient information on common oral pathologies, including tooth decay (22). The key words used were "*Cárie*" and "*Criança*" (Portuguese words meaning "Caries" AND "Child"). Each term has been combined with the Boolean operator "AND", in order to obtain results of websites with both of these terms together, and not separated. No limits were imposed to the search, except the selection of Portuguese Language, in Google Limits.

With this search methodology we try to simulate the outcome of a search conducted by a patient, as suggested by Chestnutt (22). Quality evaluation of the websites was performed by assessing the Health of the Net Foundation website, specifically the tool HON search, in order to find out if the HONcode Certification was present in Google retrieved websites (23). The HON principles that a website must comply to be certified has having quality are: authoritative, complementarity, privacy, attribution, justifiability, transparency, financial disclosure and advertising policy (18).

Results

The Google websearch performed retrieved 165.000 hits. The results obtained on this web search on the first 100 hits on Google® were categorized according its type, and are presented on Table 3, divided by each page of 10 results obtained on the Google search.

Scientific papers, in .pdf format were the most retrievable URL (n=25), followed by health portals (n=14), and Private Dental Practice (n=8). The first 100 retrievable websites had different domains, with a higher prevalence of Brazilian domains (.BR, n=68 and GOV.BR, n=5), followed by company domains (.COM, n=12). Domains related to Portugal were only found in 4 websites. The domains ranking can be observed in Table 4.

Table 3. Ranking website types with "Caries" AND "Childhood" information.

Website type	Google results per page										Total
	10	20	30	40	50	60	70	80	90	100	
Scientific Paper (.pdf)	5	5	3	2	1	4	0	1	3	1	25
Health Portal	2	1	0	3	0	1	2	1	2	2	14
Private Dental Practice	0	0	1	2	0	1	0	1	1	2	8
Newsletter	0	0	0	1	1	1	1	1	1	1	7
On-Line Magazine	0	0	0	1	2	0	3	0	0	2	8
Dentist Comment	1	1	0	0	0	0	2	0	1	0	6
Scientific Database	0	2	2	0	0	0	1	0	0	0	5
Academic Thesis	0	1	0	0	2	1	0	0	0	1	5
Blog	0	0	0	1	1	1	0	1	0	0	4
Private Medical Practice	1	0	0	0	1	0	0	0	1	0	3
On-Line Journal	0	0	1	0	0	0	0	1	0	0	2
Dental Medicine Portal	0	0	1	0	1	0	0	1	0	0	3
Insurance / Consulting website	0	0	0	0	0	0	1	0	1	0	2
Dental Products Company	1	0	0	0	0	0	0	1	0	0	2
Broken URL	0	0	0	0	0	0	0	0	0	1	1
Public Dental Practice	0	0	0	0	0	0	0	1	0	0	1
Private Nutrition Practice	0	0	0	0	0	1	0	0	0	0	1
Nurse Comment	0	0	0	0	0	0	0	1	0	0	1
On-line Community	0	0	0	0	1	0	0	0	0	0	1
Editor	0	0	1	0	0	0	0	0	0	0	1
Scientific Abstract	0	0	1	0	0	0	0	0	0	0	1
Total											100

Table 4. Domains of the retrieved websites.

Domain	Meaning	n
BR	Country Brazil	68
COM	Company	12
GOV.BR	Brazilian Government	5
PT	Country Portugal	4
ORG	Organization	4
NET	Network	4
MX	Country Mexico	2
JP	Country Japan	1
Total		100

The quality of the websites was analyzed within the Health on the Net Foundation Website (Table 5). Only 4 websites had the HON Accreditation and where therefore considered valid.

Table 5. Assessment of the HON Accreditation on the retrieved websites.

Health of the Net Foudation accreditation .html URLs only. n=75)	
Yes (with quality)	4 (5.3%)
No (without quality)	71 (94.7%)

Discussion

The usual information seeker search the health information needed in the first 2-3 pages retrieved. Although this is the tendency, we have performed a website classification of the first 100 Google results, on the "Childhood Caries" topic, in order to have a more broad range of information about the websites retrieved on this Google search. The results obtained show a variety of websites types. The most frequent results obtained were classified in scientific papers (25%), since they were uniform resource locators (URL) to .pdf documents, of articles published mostly in Brazilian Dental Journals, and were therefore more targeted to the academic community, and not the general population seeking information about the prevention, diagnosis and treatment of tooth decay in childhood. It is important to state that 50% of the first 10 results were this type of documents, and thereafter, it seems to exist a lack of oral health-consumer information in the first results pages of Google.

The following most frequent website types were health-related portals (13%, 13 in 100), which are more targeted to the general population. However, of the 13 health-related portals retrieved, only 3 had the HON Accreditation, and could therefore be "officially" classified as having quality. Of these 3, two appear on the first page of Google results – 20% of the results on this page – which may be important for the oral health promotion and education of the population, although it is still a scarce number for the top hits results. No Dental Medicine Portal appeared on the first 20 results, and no HON Accreditation was present in this 3 results obtained.

Only one more website, of a Dentist Blog, had the HONcode Certification, assuming its quality. It seems to be very important to establish these quality criteria, and this type of accreditation, since the first two hits of this Google search were health-related portals with HONcode Certification, being a safety guarantee of childhood caries information available for the health-related information seekers.

It is important to consider that in our quality evaluation stated in Table 5, twenty-five per cent of the retrievable websites were portable document format (.pdf) links, and were therefore excluded from the quality evaluation of the HON, since it's only performed in websites. Although these documents are scientifically valid due to their peer-review system, they are not assumed to be information to the general population, and cannot be therefore included as childhood caries information available for health-related information seekers.

As so, it is probably a major concern to realize that only 5.3% (4 sites out of 75.) of the websites had quality, and the majority – 94.7% (71 sites in 75) – did not have this HON accreditation, which may be interpreted as non-credible information to the population, and may be a risk to the public health and contribute to a lack of oral-health education in what can be considered as fundamental in dental medicine that is caries prevention. However, 5 of the non-HON accredited web sites were of governmental domain (GOV.BR. – e.g., Newsletters) which are important to consider when evaluating its quality, although only one appeared on the Google's first ten results.

Other authors state the same Internet disadvantages of online health information seeking, with major concerns on credibility, quality and regulation of this information (8-10,24,25). Chestnutt (22) concludes that there is a wide range of reading levels in dental information websites, and therefore the dentist and his team should be aware that additional information and oral-health advises may be important to help patients interpret this type of information retrieved on a Google search.

Concerning the URL domains, 73% of the websites had Brazilian Domains (.BR and GOV.BR), and only 4% were related to a Portuguese Domain (.PT), which is probably related to the Internet penetration rates and number of people associated (Portugal: 48.1% – above 5 million (26); Brazil: 37.8% – almost 76 million, 15x more than Portuguese people (27)). No websites of other Portuguese speaking countries from the CPLP were obtained, which may be due to lower internet penetration rate in this countries (27) (Angola – 4.3%; Cape Verde – 23.9%; Guine Bissau – 2.4%; Mozambique – 1.6%; Sao Tome and Principe – 11.7%, East Timor – 0.2%).

This scarce valid oral-health information in Portuguese in a WWW search is, in part, in agreement with the conclusions of Singh (21) when this author states that the world is primarily non-English speaking, most of the web-searches are done in the native/local language, and the global and local health agencies should translate their institutional (valid) websites into more languages (21).

It is also important to realize that although the WHO is the global health agency, and Portuguese if the 7th language in the world, it is not one of the official languages of the WHO website. No WHO-affiliated web-pages with childhood dental caries information were retrieved in our Google search.

If we consider the millions of Portuguese speaking people in the World, it seems to be very important to have (oral) health websites with quality to improve the education of this population and avoid public-health related issues.

Conclusions

Within the limitations of our study, it may be concluded that although childhood caries is the world's most common childhood disease, and Portuguese is one of the most spoken languages in the world, there seems to be a lack of quality childhood caries information available for the Portuguese speaking oral health-consumers on the WWW.

This fact is inconsonant with the major importance of this disease and with the Internet as the most important mean of transmitting information currently. Efforts should be applied to provide more childhood dental caries information on the WWW to the Portuguese speaking population.

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