A review of the effects of oral health media hype on clients' perception of treatment

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ABSTRACT

Objectives: Research shows that approximately 75% of people worldwide access the internet for health information. Lower calibre websites often use inaccurate claims to attract internet browsers. The objective of this review is to alert oral health care professionals (OHCPs) to the impact of oral health media hype on client perceptions of oral care. It also aims to provide OHCPs with tools to educate clients on how to identify credible oral health information online so that they can make informed oral health treatment decisions. Methods: A literature search was conducted using PubMed and Google Scholar. The returns were screened using inclusion and exclusion criteria. Results: Thirteen studies met the inclusion criteria, of which 12 (92%) identified that clients browse the internet to research oral health conditions and treatments. Eleven studies (85%) concluded that media outlets influence client perceptions of oral health care and treatment. All 13 studies (100%) found that OHCPs and organizations should better guide clients with tools to discern between evidence-based (EB) and non-evidence-based (NEB) online health information. Discussion: According to the literature, viewing NEB oral health information on the internet affects clients' perceptions of oral health care, which may lead to potentially harmful treatment decisions. Chairside education is effective in reducing the impact of oral health misinformation. Conclusion: OHCPs have the responsibility to address the impact of media hype on clients' perception of oral health care and to direct them to credible health information.

INTRODUCTION

There are more than 4 billion web pages containing health information published on the internet.¹ Research has shown that up to 75% of people worldwide use the internet to access health information.²,³ Clients often research their symptoms online before consulting with a health care professional. Armed with inaccurate health information found on the internet, clients may be more likely to challenge or disagree with the health care professional’s diagnosis. Recently, the United States Surgeon General cited online misinformation regarding COVID-19 and the COVID vaccine as an “urgent threat” to the public.⁴ It is imperative that health care professionals play a vital role

PRACTICAL IMPLICATIONS OF THIS RESEARCH

- Oral health care professionals should stay current with oral health media hype to address clients’ misconceptions about oral health care.
- Oral health care professionals should educate clients on the importance of fact checking articles before relying on oral health-related information published on the internet.

Keywords: dentistry, dental hygiene; health communication; internet; oral health care; social media

CDHA Research Agenda category: capacity building of the profession
in the fight against “health misinformation.”

The Pew Research Center, on their web page “The Internet and Health,” reported that an estimated 1 in 3 US adults research their medical condition online and 8 in 10 health inquiries start at a search engine. Population demographics also play a key role in the use of the internet for health-related information. To improve oral health outcomes for clients, oral health care providers (OHCPs) should educate clients on how to differentiate between evidence-based (EB) health-related information versus non-evidence-based (NEB) health-related information found on the internet. Access to credible sources of oral and medical health care information may assist clients in making informed decisions about their oral health. It is important for OHCPs to recognize how NEB information may change clients’ perceptions of recommended treatment. Addressing false health claims found online could help influence clients’ perception of oral health care.

The internet provides oral health care information in different formats for public consumption. Documentaries and articles published on the internet are two examples of media that present oral health care information, often with eye-catching titles. These sources may cite credible evidence but they may focus on sensational information or use information out of context to attract readers. Social media is another source of health information that is commonly used by the public. The keyword-based search engine YouTube has approximately 30 million health-related videos and has become one of the most popular social media sites for obtaining and sharing health information. YouTube is a public website that accepts videos and comments from everyone and allows for anonymous access, although viewer comments may at times be misleading or damaging. It is an accessible platform that publishes any content as long as it meets the standard. Businesses often pay for the placement of their ads and YouTube benefits financially. Popular online video platforms and product placement companies also pay fees to appear at the top of search engine result pages. Product-focused videos tend to be 1 to 3 minutes in length as opposed to educational videos produced by credible organizations, which may be 10 to 15 minutes in length. Video length is relevant because, as Dias da Silva et al., found in their study of dental education content on YouTube, shorter videos are viewed more often and in their entirety than longer videos.

To understand the effects of media hype on oral health care, one first needs to understand 1) why people search for health care advice on the internet and 2) how people choose their information sources. A recent study indicated that the general public researches oral health conditions prior to visiting the OHCP. Free and easily accessible video streaming websites offer clients a convenient and efficient way to receive health information. Internet searches for oral health-related information may help reduce client anxiety, assist in understanding current health conditions or treatments, and identify options for alternative treatments. The intent of this narrative review is to alert OHCPs to the increasing influence of the internet on clients’ perception of oral health care. As there is minimal evidence on this topic, this review’s objectives are to assist OHCPs in providing education to clients on accessing and selecting quality evidence-based sources of oral health information to better support decisions about their health care.

METHODS

A narrative review approach was used to gather evidence on the topic. The research team (N = 5) conducted a search of 2 databases, PubMed and Google Scholar, using the following inclusion criteria: 1) articles written in English; 2) preferably published within the past 5 years; and 3) credible or peer reviewed. Sources excluded from the review were 1) non-peer reviewed and/or 2) written for educators or practitioners rather than for the general public or deemed irrelevant (case reports, etc.). The following key phrases were used to search the literature: dental media misinformation, dental misinformation on YouTube, social media affecting dentistry, and YouTube’s effect on dentistry.

Based on the inclusion criteria, titles and abstracts of potential articles were initially screened by 3 team members. Full-text articles were then reviewed by 3 team members and excluded if they failed to meet the inclusion criteria. The team independently read each study carefully and in its entirety; afterwards, sources that were agreed upon by all team members were retained for the review (N = 13) (Figure 1).

RESULTS

The initial literature search identified 54 unique studies. The titles and abstracts of all studies were preliminarily screened by 3 team members, resulting in no studies being excluded. The full text of all 54 studies was then read by 3 team members, resulting in the exclusion of 41 studies due to irrelevance (i.e., articles aimed at educators or practitioners, or case reports). The remaining 13 studies met the inclusion criteria (Table 1). Of the 13 included studies, 7 were quantitative (53%), 4 were qualitative (31%), and 2 were mixed methods (15%). Eight studies were cross-sectional research designs (62%); 5 studies were descriptive (38%). No studies were excluded because of poor research designs.

Studies included in the review examined the influence of the internet, including social media, on clients’ perception of oral health and oral care. Of the 13 studies included, 12 (92%) identified that clients increasingly browse the internet to learn about oral health conditions and treatment. Eleven studies (85%) concluded that the internet appears to play a powerful role in influencing client perceptions of oral health care and treatment. All 13 studies (100%) found
Figure 1. PRISMA flow chart for literature reviews
Table 1. Studies included in this literature review (N = 13)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Research design</th>
<th>Major conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abu-Ghazaleh et al. 2018</td>
<td>Quantitative; descriptive</td>
<td>Social media sites are increasingly used to obtain health-related information, particularly by clients. Dental professionals should place more emphasis on posting accurate health-related information suitable for the layperson, including basic management of oral health concerns.</td>
</tr>
<tr>
<td>Alalawi et al. 2019</td>
<td>Quantitative; cross-sectional</td>
<td>Social networking sites are gaining attention from clients, health care practitioners, and researchers. Clients increasingly use social networking sites to get updated on health information. The presence of oral health care professionals on social networking sites and correct client–provider interaction online are important for communicating accurate health information to new and former clients.</td>
</tr>
<tr>
<td>Bhola and Hellyer 2016</td>
<td>Qualitative; descriptive</td>
<td>Evidence suggests that social media has a role in health care education, particularly due to the widespread use of these platforms. Dental educators should teach students how to use social media safely to supplement foundational training, as misinformation also exists on the Internet.</td>
</tr>
<tr>
<td>Dias da Silva et al. 2019</td>
<td>Quantitative; cross-sectional</td>
<td>Most of the educational content found on popular websites, such as YouTube, does not match published reliability criteria. Dental educators should teach students how to search for reliable video resources online.</td>
</tr>
<tr>
<td>Emmott et al. 2021</td>
<td>Mixed-methods; cross-sectional</td>
<td>Social media is used to extensively seek antibiotics, avoid dental care, and provide support to people with toothaches. Dental providers should manage client behaviour by addressing expectations through proper education.</td>
</tr>
<tr>
<td>Haslam et al. 2019</td>
<td>Quantitative; cross-sectional</td>
<td>The public is increasingly using social media to gain knowledge on health issues. Health care providers have a responsibility to ensure that health-related videos and posts contain accurate information and are readily accessible to searchers.</td>
</tr>
<tr>
<td>Holden 2019</td>
<td>Mixed-methods; cross-sectional</td>
<td>Discourses within online media contribute to the development and understanding of contexts and affect the promotion of oral health. Many online media sources continue to mislead the public, suggesting a weak link between oral and overall health.</td>
</tr>
<tr>
<td>Knosel et al. 2011</td>
<td>Quantitative; cross-sectional</td>
<td>Videos under a category labeled “Education” on YouTube have a higher degree of usefulness and informational value for people. Dental educators need to recognize the importance of these websites in shaping public opinion about oral health information and oral health professions.</td>
</tr>
<tr>
<td>Nason et al. 2016</td>
<td>Quantitative; cross-sectional</td>
<td>YouTube videos for endodontics varied by source and content was incomplete. Danger exists as clients rely on YouTube for information. Endodontic professionals need to direct clients towards high-quality information.</td>
</tr>
<tr>
<td>Oakley and Spallek 2012</td>
<td>Qualitative; descriptive</td>
<td>The Internet and social media are used to disseminate information. However, published information may be inappropriate or inaccessible. Calls for dental professionals to use social media as another means to provide accurate dental education.</td>
</tr>
<tr>
<td>Puspitasari and Firdauzy 2019</td>
<td>Quantitative; cross-sectional</td>
<td>Clients are increasingly using online sources to engage with health information and care needs. Intention to use social media for health-related purposes is driven by awareness of preventing or reducing health problems. Social media should be optimized for promoting a healthy lifestyle and educating society about health and care management.</td>
</tr>
<tr>
<td>Stellefson et al. 2020</td>
<td>Qualitative; descriptive</td>
<td>The use of social media for public health education is rising, particularly as the Internet removes physical barriers for access to information. Social media should be optimized to effectively leverage technological tools in promoting health messages and reducing misinformation to the public.</td>
</tr>
<tr>
<td>Ventola 2014</td>
<td>Qualitative; descriptive</td>
<td>Social media tools can be used to enhance client education and professional networking but can also present potential risks for distribution of poor-quality information and other legal/ethical issues. Health care institutions and professional organizations should issue guidelines to prevent and/or mitigate these risks online.</td>
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</table>
that OHCPs, educators, and organizations need to better guide clients with the tools to discern between EB and NEB online health information. Collectively, these studies identified a major theme, namely that popular internet and social media sites often feature information that is not evidence based and that these important platforms should be monitored actively and reported to protect the public from misinformation.2,6-8,10-15,20,27,28,31

**DISCUSSION**

This narrative review found that people increasingly rely on the internet to obtain answers to their oral health questions. Results from a recent study showed that limited access to care, anxiety, and cost of oral health care were factors that prompted clients to search the internet for oral health-related information.20 Although the potential benefits of clients searching oral health conditions online include verification of medical information, accessing social support groups, and improving client–physician communication,8 Unfortunately, this increased reliance on the internet has motivated many clients to make oral health decisions based on unverified websites.7,8 It is critical for clients reading these publications from industry-sponsored clinical trials that published the results of research trials with worldwide influence, published an article titled, “Feeling guilty about not flossing? Maybe there’s no need.”18 This heading led the public to falsely believe that flossing is no longer necessary to maintain good oral health. The US Department of Health and Human Services (HHS), in response, reported the importance of flossing in a statement to the ADA, which read: “Flossing is an important oral hygiene practice.”18 Research indicates that flossing reduces proximal caries risk and promotes oral health.18 Flossing is an intricate and sometimes complex task that requires proper technique. Clients with limited manual dexterity and other disabilities may find this part of the oral hygiene regimen difficult to perform.19 For an individual who finds a flossing routine difficult to incorporate into their lifestyle, claims of the ineffectiveness of flossing are more likely to be believed.21 "Flossing is an important oral hygiene practice."18 The true cost of such advertisements is paid by the consumer who may be ill-equipped to differentiate fact from fiction. There is evidence that charcoal has an abrasive effect on enamel and gingival tissues.23

The use of the internet and social media as sources of oral health information is increasing. Stellefson et al.11 concluded that social media could be effective in promoting health messages and reducing misinformation. Unfortunately, due to the abundance of health information on the internet, clients may be skeptical about an oral health provider’s treatment plan after reading content on unverified websites.7,8 It is critical for clients reading oral health care information online to know if the content is accurate and objective. Dias da Silva et al.7 described misinformation as inaccurate, misleading information presented and promoted to deliberately cause harm to the public or to create profit; whereas, misinformation is false information that is spread, regardless of intent to mislead. Many articles and videos found online, particularly those on commercial websites, are marketed to attract the reader.8 Media sources often use flashy headlines with commonly searched keywords to increase their visibility.12,13 The primary intent of many of these websites is to attract users to purchase products.12,13

**Industry-sponsored research**

Historically, and perhaps still of relevance today, certain companies only publish the results of research trials if they are favourable. In other words, if clients view publications from industry-sponsored clinical trials that only demonstrate a product’s effectiveness, then they may be misled to believe that a product’s claims are based on objectively presented clinical evidence. These selective publications may also lead OHCPs to recommend or endorse certain products for the client, who trust their health care provider’s recommendation.14,15

**Reporting of research data by media organizations**

Unreliable information on the internet is a common theme among the articles reviewed, with potentially serious consequences for unsuspecting clients. Popular news outlets have published false claims based on a misinterpretation of guidelines from the American Dental Association (ADA), Canadian Dental Association (CDA), and other oral health organizations.16,17 For example, the *New York Times*, a prestigious news outlet with worldwide influence, published an article titled, “Feeling guilty about not flossing? Maybe there’s no need.”18 This heading led the public to falsely believe that flossing is no longer necessary to maintain good oral health. The US Department of Health and Human Services (HHS), in response, reported the importance of flossing in a statement to the ADA, which read: “Flossing is an important oral hygiene practice.”18 Research indicates that flossing reduces proximal caries risk and promotes oral health.18 Flossing is an intricate and sometimes complex task that requires proper technique. Clients with limited manual dexterity and other disabilities may find this part of the oral hygiene regimen difficult to perform.19 For an individual who finds a flossing routine difficult to incorporate into their lifestyle, claims of the ineffectiveness of flossing are more likely to be believed. The *New York Times*’ dramatic headline caught the eye of readers around the globe but their misinterpretation of the research and its recommendations resulted in potentially harmful consequences for the public’s oral health.

**Marketing of oral care products**

Health care institutions and OHCPs should issue guidelines to mitigate the risk of social media hype.20 Examples of social media hype are easily found in the marketing of dental products, such as charcoal-based dentifrices and teeth whitening products on YouTube.8 There is an insufficient amount of scientific evidence to demonstrate the therapeutic, cosmetic, and health benefits of charcoal-based dentifrices.21-23 The true cost of such advertisements is paid by the consumer who may be ill-equipped to differentiate fact from fiction. There is evidence that charcoal has an abrasive effect on enamel and ginvial tissues.23

**Documentaries produced for commercial gain**

Another example of misleading media is the *Root Cause* documentary, which debuted on the popular streaming/media service, Netflix, Inc.25 The documentary follows an individual who claimed that they developed certain health problems due to root canal treatments.25 After the release of this documentary, individuals who had or needed endodontic therapy started to question their dental treatment. The *Root Cause* documentary sowed doubt and confusion, stated unsupported information, and misled the public.17,26
How oral health care professionals can counteract misinformation

An OHCP should know how to properly address a client’s concerns over information found on the internet. The examples described demonstrate the importance of an OHCP staying current with oral health trends so they can educate their clients to look for answers from reliable sources, such as peer-reviewed research articles or government, educational, and organization websites.20

OHCPs may talk to their clients about existing platforms that verify the credibility of web-related health information such as The Health On the Net (HON) Foundation and the Utilization Review Accreditation Commission’s (URAC) Health Website Accreditation Program.22,23 HON Foundation is dedicated to providing internet users with reliable and trustworthy health-related information.22 In order for HON Foundation to accredit a website, the website publisher must provide qualifying information, such as the purpose of the site and origin of the source used, and meet the foundation’s ethical criteria. HON Foundation’s goal is to safeguard people from being influenced by incorrect or misleading health information when browsing the internet.22,23 Likewise, URAC uses diligent measurements and reporting and monitoring requirements for accrediting an organization’s website.23,27

Many clients often browse low-calibre commercial websites (i.e., .com) because they are inviting or have attractive headings; some companies even pay to be placed at the top of search engine results. Clients should be instructed to consider if the content of a website is evidence based and inspect the domain of internet sources to differentiate between credible (i.e., .gov, .edu or .org.) and non-credible sites.14,28 Examples of high-calibre information sources include government websites, such as National Institutes of Health, Centers for Disease Control and Prevention, US Department of Health and Human Services, and Canadian Institute for Health Information. In addition, professional association websites, such as ADA, American Dental Hygienists’ Association (ADHA), CDA, and Canadian Dental Hygienists Association (CDHA) provide credible, free, and easily accessible articles, fact sheets, and videos for public consumption15,21 (Table 2).

The Cochrane Collaboration was launched over 20 years ago with the mission to produce high-quality synthesized reviews of the literature and promote EB decision-making practices. The Cochrane Collaboration has also been working towards obtaining all the results from industry-sponsored research, which will help OHCPs in making informed decisions on the use of products. Armed with accurate information, OHCPs can then educate their clients regarding specific products, their efficacy and safety.

Table 2. Examples of credible sources of oral health information for clients on the internet

<table>
<thead>
<tr>
<th>Source</th>
<th>Website</th>
<th>Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centers for Disease Control and Prevention</td>
<td><a href="http://www.cdc.gov">www.cdc.gov</a></td>
<td>Governmental</td>
</tr>
<tr>
<td>HealthFinder</td>
<td>healthfinder.gov</td>
<td>Governmental</td>
</tr>
<tr>
<td>MedlinePlus</td>
<td>medlineplus.gov</td>
<td>Governmental</td>
</tr>
<tr>
<td>American Dental Association</td>
<td><a href="http://www.ada.org/en">www.ada.org/en</a></td>
<td>Organizational</td>
</tr>
<tr>
<td>American Dental Hygienists’ Association</td>
<td><a href="http://www.adha.org">www.adha.org</a></td>
<td>Organizational</td>
</tr>
<tr>
<td>Canadian Dental Association</td>
<td><a href="http://www.cda-adc.ca/en/index.asp">www.cda-adc.ca/en/index.asp</a></td>
<td>Organizational</td>
</tr>
<tr>
<td>Canadian Dental Hygienists Association</td>
<td><a href="http://www.cdha.ca">www.cdha.ca</a>; <a href="http://www.dentalhygienecanada.ca">www.dentalhygienecanada.ca</a></td>
<td>Organizational</td>
</tr>
<tr>
<td>FDI World Dental Federation</td>
<td><a href="http://www.fdiworlddental.org">www.fdiworlddental.org</a></td>
<td>Organizational</td>
</tr>
<tr>
<td>Health on the Net</td>
<td><a href="http://www.hon.ch/en/">www.hon.ch/en/</a></td>
<td>Organizational</td>
</tr>
<tr>
<td>Utilization Review Accreditation Commission</td>
<td><a href="http://www.urac.org">www.urac.org</a></td>
<td>Organizational</td>
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</tbody>
</table>
Currently, some oral health products, such as charcoal toothpastes, do not display the ADA or CDA Seal of Acceptance. In order for a product to display such a seal it has to undergo extensive testing to ensure quality and efficacy. Educating the client about the significance of oral hygiene products displaying the CDA or ADA seal serves as a simple intervention for client education. The CDA or ADA seal should help clients differentiate between products that will improve their oral health and those that may make unsubstantiated claims, such as having antimicrobial, antibacterial, and antiviral properties.

Promoting the welfare of clients is an ethical duty entrusted to OHCPs. It is of great value to convey both significant and insignificant results of trials for the sake of health promotion and disease prevention in our clients. The OHCP should educate their clients on how EB information aids in making informed health decisions. The goal is to encourage clients browsing the internet to look beyond the headlines and teach them how to discern credible literature using basic screening skills and tools. Table 2 lists some credible sources of oral health information that can be presented chairside by the OHCP to the client. The OHCP should also advise their clients to inspect the dates of the sources they find on the internet. For example, sources with “last updated” dates that are 5 years old or more may be outdated or inaccurate. Finally, OHCPs should regularly inspect the currency and accuracy of the health education materials that are distributed to clients in the office.

**CONCLUSION**

Oral health care professionals must be aware that oral health information posted on some commercial and organizational websites is intended to market a particular product, perspective, and shape the public’s opinion. OHCPs should, therefore, be proactive in helping clients understand how to identify credible information on the internet. Second, OHCPs should caution clients on the potential harms of following NEB recommendations, including potential impacts on oral and overall health. Most importantly, OHCPs should remain aware of the increasing impact of media hype on clients’ perception of oral health care and help guide clients with the tools to be EB consumers.

**ACKNOWLEDGEMENTS**

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**CONFLICTS OF INTEREST**

The authors have declared no conflicts of interest. No funding was received for this study. All authors have made substantial contributions to the study and are responsible for its content.

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