

# Breast-feeding and malocclusions

## The quality and level of evidence on the Internet for the public

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Health care professionals have long espoused the many benefits of breast milk and breast-feeding because of the positive affect on the nutritional, immunologic, developmental, cognitive, and emotional well-being of the child.<sup>1</sup> To protect, promote, and support appropriate feeding for infants and young children, “exclusive breast-feeding for 6 months and continued breast-feeding up to 2 years of age or beyond” forms part of the global strategy of the World Health Organization.<sup>2</sup> Investigators have confirmed the dual health promotion and disease prevention effects of breast-feeding and breast milk on children in a series of systematic reviews and meta-analyses<sup>3-9</sup>; 1 set of investigators<sup>7</sup> found breast-feeding to have a protective effect against the development of malocclusions. A malocclusion is “[a] deviation in intramaxillary and/or intermaxillary relations of teeth from normal occlusion.”<sup>10</sup> Overall, study participants who were breast-fed were 70% less likely to develop a malocclusion compared with those who were never breast-fed or were breast-fed for short periods.<sup>7</sup> These effects may result from the specific use of orofacial musculature and the avoidance of factors that can cause malocclusions, such as nonnutritive sucking.<sup>11-16</sup> The presence of malocclusions may provoke unfavorable social responses.<sup>17</sup> In addition, orthodontic treatment of children carries economic implications for patients, their caretakers and families, health service providers, and society as a whole.<sup>18</sup> Prevention or interception of harmful behaviors may prevent the development of malocclusions, minimize their psychosocial affect, and reduce the demand for

### ABSTRACT

**Background.** The authors sought to assess the quality of information on the Internet for laypeople regarding the effect of breast-feeding on malocclusions and to determine the levels of evidence of the articles cited to support the information.

**Methods.** The first author (E.J.D.) entered a key word term, “breast-feeding and crooked teeth,” and a natural language term, “does breast-feeding protect against crooked teeth,” into 4 search engines. The author performed consecutive sampling of every Web site until 5 Web sites were identified that fulfilled the inclusion criteria per search engine, per search term, producing 40 Web sites for evaluation. The author assessed quality using the LIDA instrument and determined the levels of evidence of the cited articles according to the Joanna Briggs Institute Levels of Evidence.

**Results.** The author determined that the quality of the Web sites was moderate, represented by a median overall LIDA score of 73%. The author identified only 2 high-quality Web sites. Nearly one-half of the Web sites cited a combined total of 10 scientific articles to support their content, and these ranged from moderate to very low levels of evidence.

**Conclusions.** The authors found the quality of freely available information on the Internet for laypeople about the protective effect of breast-feeding against malocclusions to be moderate and that the evidence base cited to support the content ranged from moderate to very low levels of evidence.

**Practical Implications.** Increasingly, patients are seeking health information online, although not all information is credible. Dental health care practitioners should regularly review their practices’ Web sites to ensure that they are accessible and that the content is usable, reliable, and up-to-date, particularly as new, higher-level evidence becomes available.

**Key Words.** Breast-feeding; consumer health information; Internet; malocclusion; orthodontics; search engine.

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orthodontic treatment and the associated economic burden. Factors positively influencing breast-feeding decisions include a woman's own history of having been breast-fed as an infant<sup>19</sup> as well as the accuracy and timing of information she receives.<sup>20,21</sup> People traditionally obtain information from their social network; health care professionals; prenatal course instructors; written information provided in health care settings, libraries, or bookshops; and telephone helplines.<sup>22</sup> Conflicting and incorrect advice can cause confusion<sup>23</sup> and can negatively affect breast-feeding.<sup>24</sup>

With the cost of acquiring computer hardware becoming more affordable for the general public, coupled with the rapid rate of development of digital technology, the popular uptake of the Internet ensued, beginning in the mid-1990s. People access the Internet for a variety of reasons, including to address a lack of patient-centered communication or dissatisfaction with medical care,<sup>25</sup> to fill a knowledge gap,<sup>26,27</sup> to verify existing personal knowledge,<sup>26</sup> to get reassurance, to obtain alternative opinions, and to avoid professional consultations for "trivial" matters.<sup>27</sup> Reliable, accurate, and high-quality health-related information and resources are available from vetted Web sites of professional organizations that laypeople may consult to better understand the medical conditions that have been diagnosed in them or someone they know. On the other hand, incalculable Web sites offer false, inaccurate, and incomplete information that, if relied on for the purposes of self-diagnosis and subsequent self-treatment, may not necessarily be correct, and, importantly, can be detrimental.<sup>28</sup>

Over 50% of first-time mothers have used general Internet searches to seek information about breast-feeding.<sup>29</sup> In November 2015, 46% of the world's population were Internet users; regionally, this amounted to 88% of the North American population and 78% of the Australian population.<sup>30</sup> Seventy-two percent of adult Internet users have looked online for health information, and over three-quarters of these "online health seekers" had used a search engine.<sup>31</sup> Content on the Internet is unregulated; anyone can write and upload content that may not necessarily be reliable. The quality of consumer health information on the Internet about breast-feeding and its protective effect against the development of malocclusions remains unclear and, to our knowledge, had not previously been investigated. In this study, we aimed to assess the quality of information on the Internet targeting laypeople concerning the relationship between breast-feeding and malocclusions and to determine the level of evidence of the cited scientific articles on Web sites for laypeople.

## METHODS

**Search strategy.** The first author (E.J.D.) deemed a key word term, "breast-feeding and crooked teeth," and a natural language term, "does breast-feeding protect

against crooked teeth," to be appropriate after screening the Web sites related to the URLs generated in a pilot study using these search terms. The most popular search engines include Google, Yahoo!, Bing, and Ask.com,<sup>32</sup> and the author used these 4 search engines in this order. A single author (E.J.D.) entered both search terms alternatively into each search engine using a computer connected to the Internet in Australia, without modifying the default settings of any of the search engines; investigators have used this methodology in previous research studies.<sup>33</sup>

**Inclusion and exclusion criteria.** The sole inclusion criteria were free access to the Web site and English-language content. The author (E.J.D.) excluded videos, advertisements, professional or scientific literature, professional forums or blogs for health care professionals, and public discussion forums. The author also excluded Web sites that discussed breast-feeding but not malocclusions, and vice versa, as these would not be relevant for the purposes of this study. The author omitted the internal and external duplicates of Web sites from reassessment that she had identified already.

**Identification of Web sites.** The first author (E.J.D.) performed consecutive sampling of every Web site that met the inclusion criteria from October 19, 2015, through October 22, 2015, until she identified 5 Web sites within each search engine per search term. The author used the key word term first across all search engines, followed by the natural language term. The author identified 20 Web sites per search term, thus producing 40 different Web sites for evaluation.

**Analysis of the quality of Web site content.** The first author (E.J.D.) used the LIDA instrument (Version 1.2)<sup>34</sup> to perform quality analysis; this author is calibrated in its use.<sup>35</sup> The LIDA instrument is a set of free validation tools developed by Minervation, a commercial health care consultancy firm, to assess whether a health Web site provides information that is accessible, relevant, and of high quality ([www.minervation.com](http://www.minervation.com)). The LIDA instrument measures 3 areas: level 1, accessibility (whether the Web site meets legal standards and users can access the information); level 2, usability (whether users can find the information they need); and level 3, reliability (whether the Web site provides comprehensive, relevant, and unbiased information).<sup>35</sup> To determine a measurement for level 1, the assessor enters the URL of the Web site of interest into the LIDA instrument site (<http://lida.minervation.com/>), and the online software automatically generates a score for accessibility. To determine measurements for levels 2 and 3, each question was scored on a scale of 0 to 3 (0 = never, 1 = sometimes, 2 = mostly, 3 = always), which produces summative scores for usability and reliability; scores for each level contribute to

**ABBREVIATION KEY.** JBI: Joanna Briggs Institute.

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