

# Quality, Range, and Legibility in Web Sites Related to Orofacial Functions

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## Abstract

### Keywords

- ▶ speech
- ▶ language and hearing sciences
- ▶ breast feeding
- ▶ information technologies and communication projects
- ▶ education
- ▶ distance
- ▶ telemedicine
- ▶ educational technology

**Introduction** Plenty of information about health is available on the Internet; however, quality and legibility are not always evaluated. Knowledge regarding orofacial functions can be considered important for the population because it allows proper stimulus, early diagnosis, and prevention of the oral myofunctional alterations during early infancy.

**Objective** The aim was evaluate the quality, legibility, and range of Web sites available in Brazilian Portuguese regarding the orofacial functions.

**Methods** Selected Web sites with information directed to parents/caregivers of babies regarding breast-feeding, feeding after 6 months, deleterious oral habits, and breathing and speech were studied. The Web sites were evaluated through the application of Flesch Reading Ease Test and aspects of the Health on the Net (HON) modified code (HONCode); the range of the subjects addressed was compared with other aspects of infant development.

**Results** From the access of 350 pages of the Internet, 35 Web sites were selected and 315 excluded because they did not meet the inclusion criteria. In relation to legibility, Web sites scored an average of 61.23% in the Flesch Test, and the application of the modified HONCode showed an average of 6.43 points; an average of 2.49 subjects were found per Web site evaluated, with information on breast-feeding being more frequent and subjects such as breathing and speech less frequent.

**Conclusions** Web sites that deal with orofacial functions presented standard legibility classification. Only half of the ethical principles were considered by the modified HONCode in their majority, and most addressed subjects after “breast-feeding” were presented with restricted range.

## Introduction

The population is researching information about health on the Internet more often. For such, search engines such as Google, Yahoo!, Bing, and Ask.com are frequently used. The importance of these tools in helping the population acquire information about health is highlighted. However, this research must be analyzed, and information that presents indications of scientific evidence should be examined.<sup>1</sup>

The importance of verifying the quality of the information about health on the Internet can be observed in several themes studied, due to their reliability being frequently low.<sup>2-4</sup>

Concerned about guaranteeing the quality of the information about health offered on the Internet, the Health On the Net Foundation (HON) elaborated the free HONCode certification to advise and to stimulate Internet users to be cautious in their use of medical information obtained on the Internet, according to a set of ethical rules.<sup>5</sup> HON is a nonprofit,

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nongovernmental organization, accredited to the Economic and Social Council of the United Nations, that promotes trustworthy online health information and seeks to guide Internet use in an efficient and adequate way.<sup>6</sup>

Another important characteristic of health Web sites directed to the lay public is the legibility of the available content. The Flesch Reading Ease Index is a formula that evaluates the legibility of a text. Although superficial, it is distinguished as it is the first and only metric of legibility already adapted for Portuguese and able to relate a text with the age group or necessary school level for its reading.<sup>7</sup>

Legibility and ethical principles are being studied, for example, in Web sites about the Mediterranean diet, indicating the importance of users to seek advice from health professionals due to the poor quality of the information found online.<sup>8</sup> Thus, studies evaluating Web sites hosted on the Internet are significant with respect to delineating behaviors of the population, indicating how the people must carry through their searches and what they must do with the collected information.

Aiming at evaluating the information available on the Internet specifically regarding speech pathology, studies directed to stuttering and hearing deficiency are presented.<sup>9,10</sup> The first study verified that on the five available Web sites, none followed the criteria proposed by the HONCode. The second study, however, through the evaluation of 66 Web sites, pointed out highly changeable quality and legibility and noted that only 14% presented the HONCode certification. In addition, the information on hearing deficiency was, on average, rated at a difficult reading level, requiring high school/college education to be understood.

As far as orofacial functions including breathing, sucking, deglutition, chewing, and speech, the availability of information related to the normal development, adequate stimulus, early diagnosis, and prevention of the orofacial myofunction alterations during early infancy is of extreme importance, because it can assist in children's social and emotional development as well as with their learning.<sup>11-16</sup>

The objective of this work was to evaluate the quality, the legibility, and the range of Web sites available in Brazilian Portuguese regarding the orofacial functions.

## Methods

The Google search tool was used with the keywords "site" plus "baby"; the first 10 pages returned were consulted, with

10 Web sites each, in the months of March and April 2012. The first five result pages (50 Web sites) using that tool were also cross-searched for the following words: "breast-feeding" plus "pacifier"; "breast-feeding" plus "baby's bottle"; "breast-feeding" plus "baby"; "breathing" plus "baby"; "baby" plus "speech."

Thus, 350 pages of the Internet were accessed by a judge, adopting as inclusion criteria Web sites in Brazilian Portuguese that presented information directed to parents/caregivers of babies about breast-feeding, feeding after 6 months, deleterious oral habits, breathing, and/or speech. Web sites were selected because they contained some subject on the themes, not necessarily contemplating all the topics.

To evaluate the legibility level presented by the contents of selected Web sites, Flesch Reading Ease Test was applied, inserting the texts in the Microsoft Office Word tool, where at the end of the orthographic and grammar verification, the program supplies a score. The higher the percentage, the easier to understand the document (►Table 1).<sup>7</sup>

Moreover, an analysis of the ethical aspects of each Web site was performed, evidencing possible aspects that the objective methods had not identified, using the modified HONCode,<sup>6</sup> which is based on the property, intention, qualification of the author, attribution, interactivity, and updates of Web site:

- Property: clear indication of property and/or sponsorship of Web site
- Intention: identification of the objective of Web site, being educational, commercial, or if this aspect was not clear
- Authorship: indication of who supplies the information
- Qualification of the author: determination of the professional experience of the author
- Attribution: whether it references the basis of the information in regard to references fully cited
- Interactivity: availability of an email address or other forms of interaction between the owner and the user
- Updates: the frequency or the date of the last update is available

Each one of these characteristics was subdivided into items that received a score that varied between 0, 1, or 2 (depending on the evaluated aspect). The higher the score obtained (total of 13 points), the better the quality of the Web site.

**Table 1** Levels of legibility of a text, relating to the level of education necessary for its reading

Flesch	Classification	Schooling level
100-90	Very easy	Elementary education (1st-4th grade/1st-5th year)
90-80	Easy	
80-70	Reasonably easy	
70-60	Standard	Elementary education (5th-8th grade/6th-9th year)
60-50	Reasonably difficult	
50-30	Difficult	High school and college level
30-0	Very difficult	Academic texts—presence of technical terms

The range of the subjects on baby orofacial functions was evaluated, verifying if the Web site brought information on aspects of breast-feeding, feeding after 6 months, deleterious oral habits, breathing, and speech, regardless if the information was complete or recent.

Finally, it was verified if the contents of the orofacial functions were related to oral health care, highlighting the holistic view of the patient and interdisciplinary approach.

### Data Analysis

The results were analyzed descriptively, from the study and evaluation of each Web site. The Web site's particular score was considered as well as the average related to each aspect evaluated, grouping the Web sites evaluated.

## Results

In view of the access of 350 pages of the Internet, 35 Web sites were selected from the inclusion criteria and evaluated in

regard to range, legibility, and quality. The Internet pages excluded from the study included 61% that were advertisement, 17% that did not present topics about the theme in question, and 12% that were not Web sites (blogs and links to articles).

Each one of the 35 Web sites was submitted to the Flesch Ease Reading Test, and the sites obtained the average of 61.23% on the Flesch Index (standard deviation: 8.71). In ►Fig. 1, the index of each Web site evaluated is shown. Considering orthographic verification, 17 (48.57%) Web sites presented orthographic errors.

In the modified HONCode the average score obtained was 6.43 points (standard deviation: 2.71). ►Fig. 2 shows scores of each Web site evaluated based on the seven aspects of the modified HONCode.

The range of the Web sites follows the themes studied, and a larger amount of information on breast-feeding was found and a smaller amount in subjects such as breathing and speech (►Table 2).

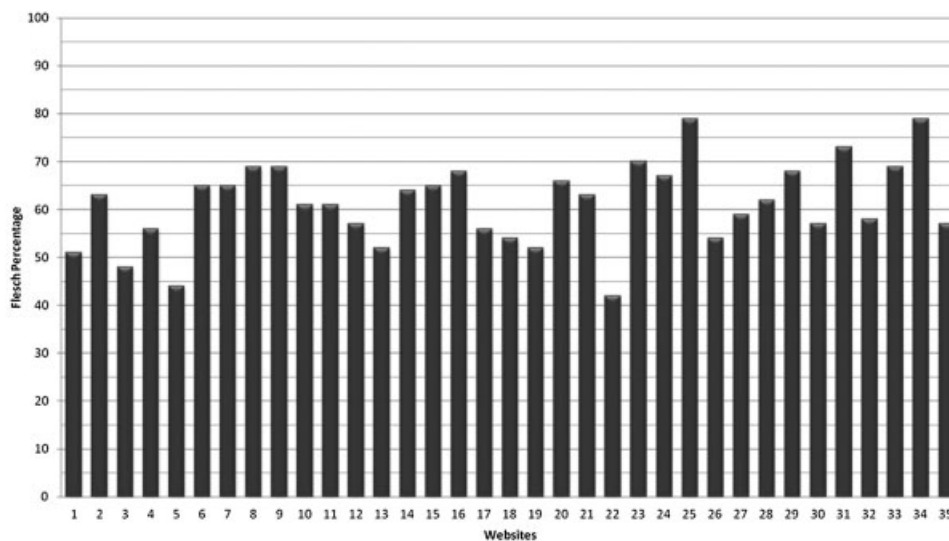


Fig. 1 Flesch Index, in percentage, of each Web site about orofacial functions.

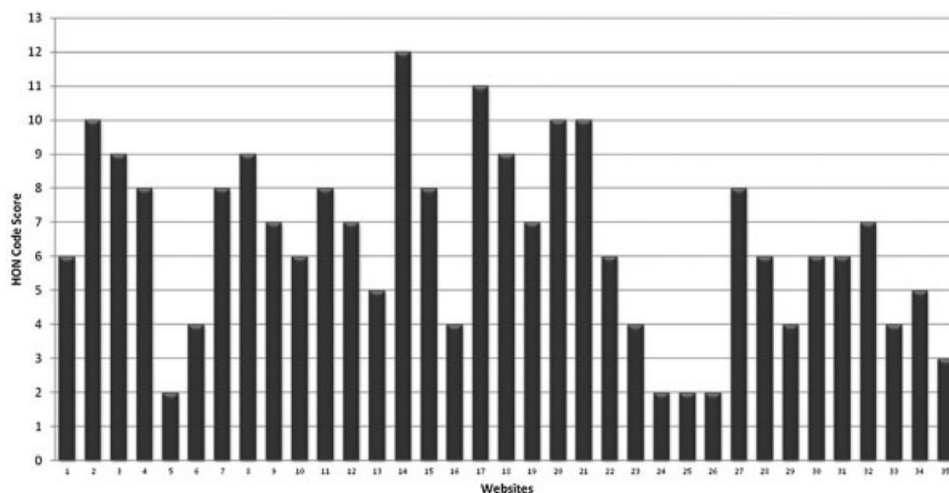


Fig. 2 Score of the modified Health on the Net (HON) code of each Web site about orofacial functions.

**Table 2** Range of Web sites on breast-feeding, feeding after 6 mo, deleterious oral habits, breathing, and speech

Themes	Web sites (total = 35)	Percentage
Breast-feeding	34	97.14
Feeding after 6 mo	23	65.71
Deleterious oral habits	19	54.29
Breathing	8	22.86
Speech	4	11.43

Considering how many subjects each Web site presented, among “breast-feeding,” “feeding after 6 months,” “deleterious oral habits,” “breathing,” and “speech,” an average of 2.49 subjects (49.8%) per Web site was presented, with standard deviation of 1.17.

The oral health aspects score was observed in 21 Web sites (60%), relating them with the orofacial functions and baby development.

In the qualitative analysis of the Web sites, technical terms were not explained through writing or illustrations in 26 (74.29%) of them, along with extensive presentation of the content, formatting making accessibility difficult, forums not mediated by professionals, copy of materials without the citation of original references, information without scientific evidence, and indication of behaviors without highlighting the importance of the medical opinion.

## Discussion

The evaluation process of the legibility and quality of the information about orofacial functions available on the Internet must be carried through systematically and frequently, due to the fact that many Web sites propose to approach this theme but do not always use language that is accessible to the majority of the population and do not take the ethical principles into consideration.

In regard to the Flesch score, the average score of the Web sites found was 61.23%, classifying them as appropriate material considering their legibility. However, the limitations of the Flesch Test must be highlighted; it is an index that evaluates the intelligibility of a text superficially, considering the number of words in sentences and the number of syllables per word but does not allow the verification of the complexity of ideas or their logical order.<sup>7</sup> This justifies the contradiction of attaining a high average of the Flesch score while simultaneous having observable grammatical errors, which is ignored by the test, giving an overall high score.

Despite approaching different themes, the findings of this study meet the pooling carried through regarding “diabetes” where 51.2% of 41 publications had Flesch scores between 50 and 75, which classifies them as easy reading.<sup>17</sup> In regard to the evaluation of educational brochures for parents about the newborn screening, 92% of the materials had low Flesch scores, in addition to having high frequency of outdated contents, being aesthetically unpleasing, and not clearly indicating the most appropriate behavior.<sup>18</sup>

The average regarding the score of the modified HONCode illustrates that Web sites fulfill only half of the ethical principles proposed. This finding agrees with the literature in several themes, which affirm the low indexes of this certification.<sup>2-4,19</sup> In the field of the orofacial motricity specific studies were not found. However, it is observed in dentistry that only 5.3% of the Web sites on dental cavities in children follow the principles of the HON.<sup>20</sup>

Observing that on average 49.8% of the topics included on the Web sites were investigated, a broader range of orofacial functions can be verified when compared with other themes, which brings rates of 33.75% regarding asthma topics and 8.3% about Chagas disease topics.<sup>3,21</sup> However, it is worth noting that the other researchers used more detailed forms, grouping several topics into the different blocks of information checked, which contributes to a smaller percentage of Web sites that consider all required topics in health.

Tests and criteria used in this study were important in the attempt to quantify the range and legibility of the Web sites found about orofacial functions. However, in the qualitative analysis, modified aspects were verified that are basic to guarantee the transmission of knowledge and that the objective instruments did not identify, such as exposition of information without scientific evidence or difficult accessibility and usability.

Web sites about allergic rhinitis, tegumentary and visceral leishmaniasis, Chagas disease, and obesity also had information that was incomplete, incorrect, and without scientific basis, which brings into doubt the credibility of the content displayed for this technology of information and communication, in addition to possible conflicts of information obtained in medical consultations.<sup>22</sup>

This way, Web sites that seem trustworthy in certain evaluations can present relevant alterations, such as not supplying higher levels of accurate health content, that can interfere with the informative potential of the Web site.<sup>23</sup>

As a first review studying existing Web sites on orofacial functions, this study stresses the need to continue guiding the public to Web addresses that can be explored and even the creation of tools that are more appropriate for the acquisition of knowledge. Thus, studies converging on the improvement of information about health available on the Internet can contribute to the reduction of the damages in health of the population,<sup>21</sup> with implications favorable to the promotion of health to those who search information on the Web and for other individuals of the community.

## Conclusion

The legibility of Web sites that approach orofacial functions was classified on average as standard, being that they fulfilled half of the ethical principles considered by the modified HONCode. Moreover, the most discussed subjects were “breast-feeding” and “feeding after 6 months,” with restricted range for not relating to the other aspects of the baby’s development of the orofacial functions.

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