

# Weblog “How Do I Breathe?”—Design and View Statistics

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## Abstract

**Introduction** Breathing is one of the vital functions of the body and is essential for the maintenance of life. Preventive measures for respiratory disorders can be used by the population, as well as early self-diagnosis and immediate search for treatment based on knowledge of this subject.

**Objective** this study developed a weblog on the breathing function targeting young people and analyzed the statistical data of views until the present moment.

**Methods** The weblog was developed, and the stages of analysis, design, development and implementation were followed. All texts were evaluated by the Flesch Reading Index to verify the language, and the statistical data were analyzed by the number of views, countries with the highest number of views, search terms used, most viewed pages and number of comments on the blog.

**Results** Issues related to the breathing function and those most cited in the literature were selected. The blog was structured using pages with content and curiosities, with texts with minimum readability of 50%, and was made available on the internet by means of the Wordpress tool. The statistics showed an increase in the number of visits after August 2015; the countries with the highest number of views were Brazil, United States and Portugal; the search terms used were unknown or related to mouth breathing; the most viewed pages related to mouth breathing and the comments addressed questions on mouth breathing, reports and compliments.

**Conclusion** The blog “How do I breathe?” aimed at young people and containing information about the breathing function, was developed and is available on the internet at the address: <https://comoeurespiro.wordpress.com>.

## Keywords

- ▶ oral breathing
- ▶ telemedicine
- ▶ internet
- ▶ speech
- ▶ language and hearing sciences

## Introduction

Nasal breathing is important for craniofacial growth and development, adequate posture of the mandible, tongue, tooth structures and orofacial musculature.<sup>1</sup> Genetic, obstructive, allergic and muscular factors may impair the nasal breathing, leading to complete or partial replacement of nasal breathing with mouth breathing.<sup>2–4</sup>

Mouth breathing impairs the development of static and dynamic structures of the stomatognathic system<sup>5–7</sup> and may also affect the school performance of students,<sup>8</sup> alter the body posture and balance<sup>9</sup> and favor the development of disorders in speech,<sup>10</sup> mastication<sup>11</sup> and swallowing.<sup>12</sup>

Mouth breathing requires multidisciplinary treatment. It involves mainly the participation of otolaryngologists, to diagnose and eliminate obstructive factors;<sup>13</sup> allergists, for

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the treatment of respiratory allergies;<sup>14</sup> orthodontists, for correction of skeletal and occlusal alterations;<sup>15</sup> speech-language pathologists, who manage the orofacial musculature and stomatognathic functions;<sup>16</sup> and physical therapists, to achieve adequate body posture and balance.<sup>17</sup> If necessary, other professionals may also participate in the team.

The alterations observed in oronasal breathers and their consequences highlight the importance of studies for prevention, diagnosis and intervention in these individuals, as well as diffusion of such information.

Currently, the internet is the most widely used medium for diffusion and search of health information on websites, weblogs and social networks. This type of interaction between health professionals and the population is important and should be valued, since the internet is a fast and accessible option that reaches different age groups, social backgrounds and regions.<sup>18</sup> A literature review retrieved only one website about mouth breathing that was made available after a scientific investigation, namely the Portal dos Bebês (<http://www.portaldosbebes.fob.usp.br>) (Corrêa et al, 2013), which provides information on the development of communication and orofacial functions occurring in children aged 0 to 3 years, including information on mouth breathing.

Searches in the internet about mouth breathing using descriptors as “oral breathing,” “mouth breathing,” “breathe through the mouth,” “why do I breathe through the mouth” easily retrieve websites and blogs on this issue. However, most online contents are related to hospital, clinics, health professional’s webpages and TV reports, thus not being developed based on a scientific method. Some websites also provide outdated or mistaken information or make use of language that is hardly understood by lay individuals.

This highlights the scarcity in the literature and websites of content on the breathing function that presents scientifically based, correct and updated information in a language accessible to the population. The general population should be more knowledgeable about the breathing function, especially younger individuals, such as teenagers. Preventive measures against breathing disorders might be adopted by the population, who may also seek treatment based on knowledge of this issue.

This study comprised the development of a weblog addressing the breathing function, targeted to young individuals, and analyzed the statistical data of views of its content so far.

## Method

The weblog was the page format selected to make the contents available in the world wide web. A blog, the most known simplification of this term, offers advantages, such as simple navigation with posts ordered by date and classified into categories, possibility of interaction with users through comments, and easy retrieval by search engines.<sup>19</sup>

Development of the blog followed four out of five stages based on the instructional design model suggested by Filatro and Piconez,<sup>20</sup> as follows:

### Stage 1 - Analysis

This stage comprised research analysis and selection of the material and actual, scientifically based information about breathing. This was performed by searching papers in reliable scientific databases, such as PubMed, Lilacs and Scielo, besides books and educational leaflets on this subject. The topics related to the issues that would be addressed in the blog were surveyed and, after this definition, a deeper search of material that described the selected topics accurately was conducted.

### Stages 2 and 3 - Design and Development

These stages aimed at developing the product that would be made available on the blog. Initially, the content was prepared and developed on the software Microsoft Word 2013 (Microsoft Corp., Redmond, WA, USA) before publishing in the internet. The texts were prepared based on the topics selected in the previous stage.

All content was developed using adequate language to the targeted age range, avoiding technical words and employing simple description of the subjects. Emphasis was given to the utilization of images, practical schemes, inclusion of curiosities and a language that might catch the reader’s attention, so that reading was simultaneously didactic and pleasant.

Images on the subject were selected on the Google image search engine. Some images were edited on the software Adobe Photoshop (Adobe Systems Inc., Mountain View, CA, USA) to make them more didactic to the target population. Proper references were included for all images retrieved in that search.

### Flesch Reading Ease Formula

Before the last stage, all texts were evaluated by the Flesch reading ease formula (FREF),<sup>21</sup> a method developed by the Austrian author Rudolf Flesch in the 1940s to verify the content language. This index analyzes the ease of text understanding, based on the vocabulary employed and the structure of sentences, to make them as compatible as possible with the language of the target population. The following equation is used for calculation of values:  $FREF = 206.835 - ([1.015 \times \text{mean sentence length}] + 0.846 \times [\text{number of syllables per 100 words}])$ .

The higher the score achieved, the better is the readability of the text analyzed. The values may be scored as presented in ► **Table 1**.<sup>22</sup>

In this study, the calculation was performed on the software Microsoft Word 2013, which provides this tool.

**Table 1** Classification of the Flesch reading ease formula

Score	Classification
75–100	Very easy—up to 4 <sup>th</sup> grade of fundamental school
50–75	Easy—fundamental school after 5 <sup>th</sup> grade
25–50	Difficult—high school and college
0–25	Very difficult—academic texts

According to the values found, texts achieving at least 50% of readability were considered for the blog.

#### Stage 4 - Publication

This stage comprised publishing the blog on the world wide web. Based on the available technological resources, this was performed using the tool Wordpress, which is freely available in the internet. After selecting the best method, all prepared material was properly edited and formatted for publication according to the standards of this tool. The registry of authors was also performed, as requested by the tool.

#### Analysis of Statistical Data of Views to the Weblog

This was performed using the tool Google Analytics (Google LLC, Mountain View, CA, USA), which is freely available by Google and compatible with the Wordpress system. This tool is installed in the blog as a plugin and allowed analysis of some parameters, such as number of visualizations (number of visits to the blog, being that each reader may be counted in more than one visit), countries with greater number of views, search terms employed (terms, words and sentences used by individuals in search engines to locate posts and webpages, and through which the readers viewed the blog), most viewed pages and number of comments in the blog. All these aspects were analyzed since the date the blog was created until the present time.

#### Result

All stages followed to develop the blog were initiated in July 2014 and published in the internet in November 2014. The stages that required more time were the analysis, design and development, with nearly 4 months, and the publication occurred in the last month. The blog was developed and

published by two speech-language pathologists with clinical experience in orofacial motricity.

#### Stage 1 - Analysis

As proposed, the study initially surveyed the issues related to breathing function most cited and frequent in the literature, that is, of greatest relevance. The study also selected subjects that might catch the interest of the target population. The selected issues were: respiratory physiology; importance of nasal breathing; definition of mouth breathing; characteristics of mouth breathers; symptoms of mouth breathing; causes of mouth breathing (flu, physical activities, adenoid hypertrophy, allergic rhinitis, nasal septum deviation, sinusitis, tonsils, presence of foreign bodies, habit of mouth breathing); snoring and apnea related to mouth breathing; prevention of allergies; nasal cleaning; olfaction and taste related to mouth breathing; hyponasality related to mouth breathing; and utilization of nasal dilators. After definition of subjects, the most pertinent texts of each subject were selected to prepare the content for publication, based on scientific papers, books and clinical experience of the authors.

#### Stages 2 and 3 - Design and Development

Aiming to construct a practical, didactic and dynamic environment targeted to a young population, the blog was structured by pages organized in a menu. The names and selected contents of each page are described in **Table 2**.

The blog also had a menu entitled “Did you know?” composed of curiosities related to the breathing function, with the following pages: The “flu voice” is related to breathing; How do we taste?; How do we smell?; In some situations, is it normal to breathe through the mouth? and Why do some athletes use nasal dilators?

**Table 2** Name of each page in the blog and respective content

Page name	Content addressed
About	Welcome to the blog—introduction to the content.
The pathway of the air we breathe	Explanation about inspiration and expiration, highlighting the stages, structures involved and importance of breathing to our body.
Why should we breathe through the nose?	Importance of nasal breathing.
Do I breathe well?	Symptoms related to mouth breathing.
Why do people breathe through the mouth?	Causes of mouth breathing: flu, physical activities, adenoid hypertrophy, allergic rhinitis, nasal septum deviation, sinusitis, tonsils, presence of foreign bodies, habit of breathing through mouth.
Breathing in sleep time	Explanation on what happens in our body while we sleep.
Why do people snore?	Description of the obstructive sleep apnea syndrome and snoring.
How can I help someone who snores?	Practical hints on how to guide people who snore.
What can I do to breathe better?	Daily actions to reduce the symptoms of allergies and contribute to reduce the mouth breathing.
Cleaning the nose	Importance of nasal cleaning and accomplishment of this procedure.
Meet the authors	Presentation of the authors who designed the blog, specifying the name and college/university.

**Table 3** Percentage and classification for each page in the blog, according to the Flesch reading ease formula

Page	Percentage	Classification
About	54%	Easy
The pathway of the air we breathe.	73%	Easy
Why should we breathe through the nose?	59%	Easy
Do I breathe well?	70%	Easy
Why do people breathe through the mouth?	59%	Easy
Breathing in sleep time	57%	Easy
Why do people snore?	50%	Easy
How can I help someone who snores?	73%	Easy
What can I do to breathe better?	72%	Easy
Cleaning the nose	77%	Very easy
The “flu voice” is related to breathing	91%	Very easy
How do we taste?	65%	Easy
How do we smell?	56%	Easy
In some situations, is it normal to breathe through the mouth?	63%	Easy
Why do some athletes use nasal dilators?	51%	Easy

The figures were selected and designed aiming to be current, easy to understand and able to catch the interest of the target population. All figures had legends to enhance the understanding on what was being shown and to allow better browsing by the individual.

#### Flesch Reading Ease Formula

All texts developed were assessed by the Flesch reading ease formula. The percentages and classification achieved in each topic are described in **Table 3**.

#### Stage 4 - Publication

Within the Wordpress tool, the free theme **Flounder** was used, and setting templates were followed to design the esthetics and visual availability of contents. The users are free to browse and view all contents according to their interest, not requiring registry in the tool. A section for comments with criticisms and suggestions was also included, which is controlled and replied by the author.

Following are the main screens of the blog, available in the world wide web [www.comoeurespiro.wordpress.com](http://www.comoeurespiro.wordpress.com). (**Fig. 1-4**):

#### Statistical Analysis of the Weblog

**Fig. 5** presents the number of visualizations to the blog at each month, in the period from November 2014 to November 2017. The number of visits increased after August 2015, and the period with greater searches for this issue was May and June 2017. Overall, since its publication until the present moment, the blog had nearly 47,000 visits.

The countries with more views to the blog were: Brazil (36,939 visits), United States (6,192 visits), Portugal (1,719 visits), Angola (190 visits), Mozambique (150 visits), Eur-

opean Union (133 visits), Germany (109 visits), France (85 visits), Japan (84 visits) and Norway (70 visits). Thus, the greater number of visits was observed for Brazil, followed by the United States and Portugal.

The search terms employed by the users are presented in **Table 4**, as well as the number of visits to the blog from each term surveyed. Most visits are related to unknown terms, that is, terms not recognized by the Wordpress tool. *Mouth breathing* and *difficulty to breathe through the nose* are among the terms most employed by the users.

The pages in the blog with greatest number of visits are presented in **Table 5**, in decreasing order. The most viewed pages are related to the contents explaining the definition and causes of mouth breathing and the pathway of air in the human body, followed by contents on breathing during sleep, the importance of nasal breathing and presentation of the blog.

After exclusion of spams and comments not related to the issue, it was possible to analyze the comments received during the study period. Since its publication, the blog received 30 comments, 14 from females and 15 from males. The comments were mainly related to doubts on mouth breathing and personal and family reports, and complimentary comments were also received.

#### Discussion

Currently, several options are available to share information on health promotion on the internet. Among these possibilities, blogs and websites have been widely used and have been achieving positive results with the combination of technology and information.<sup>22-26</sup> Thus, the internet is currently considered the most widespread communication tool

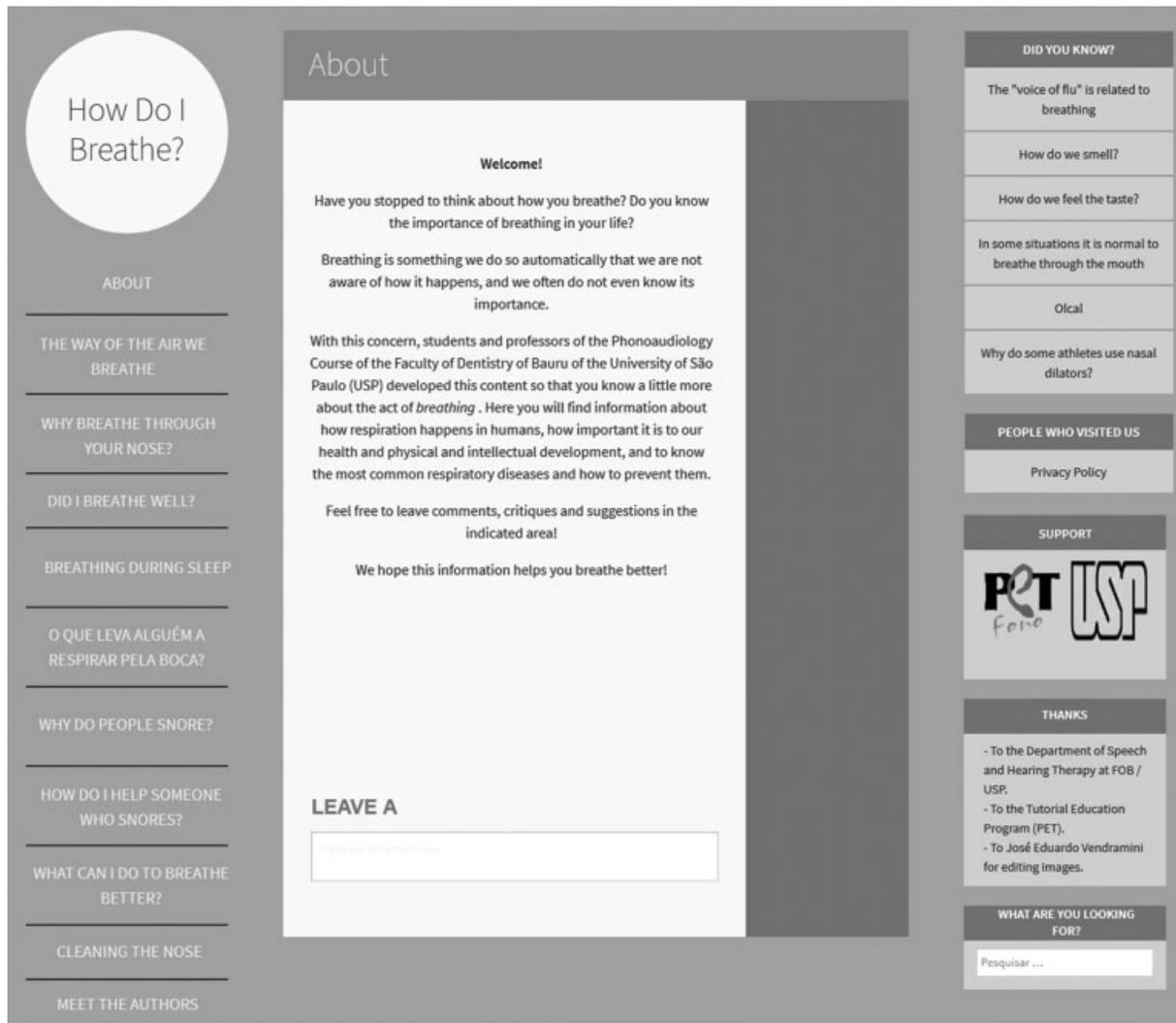


Fig. 1 Illustration of the initial page of the blog “How do I breathe?”

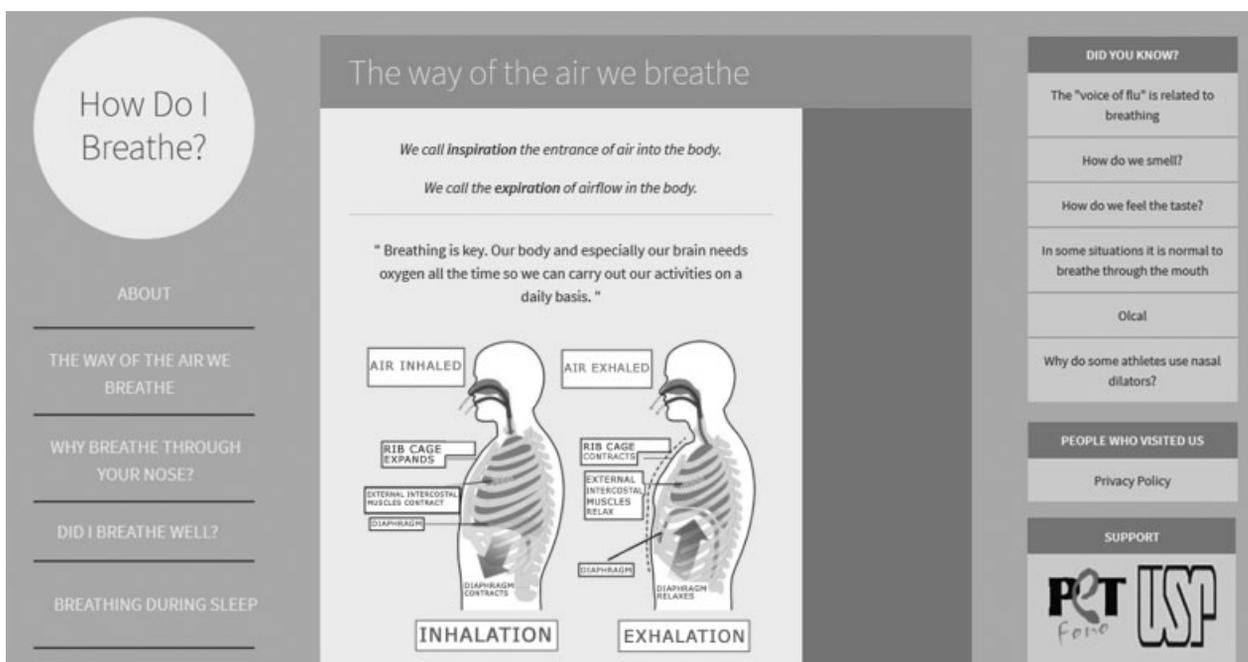


Fig. 2 Partial illustration of the page “The pathway of the air we breathe” of the blog “How do I breathe?”

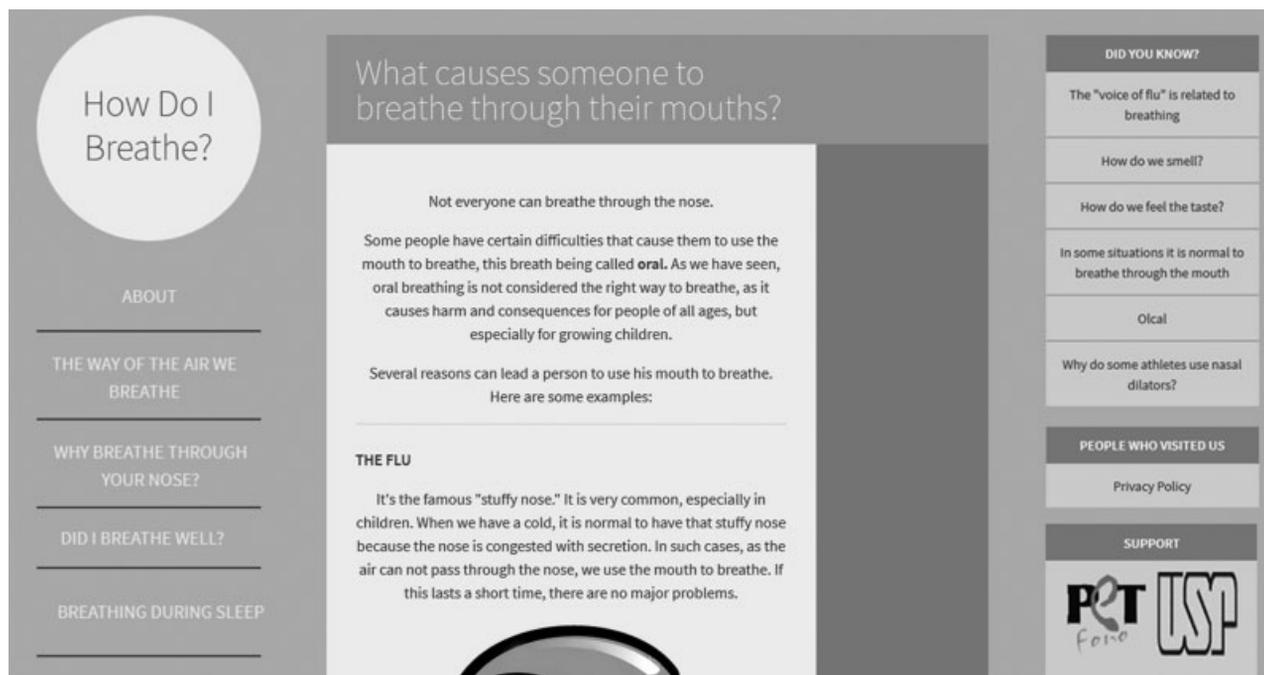


Fig. 3 Partial illustration of the page “Why do people breathe through the mouth?” of the blog “How do I breathe?”

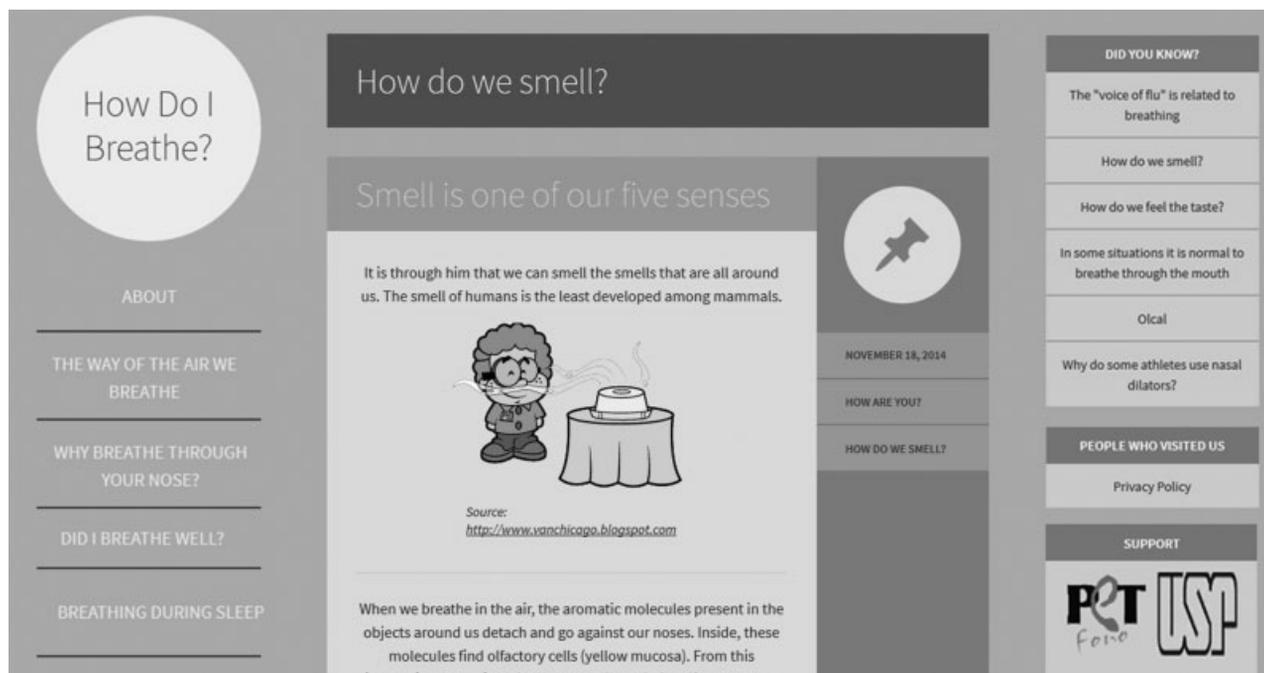


Fig. 4 Partial illustration of the page “How do we smell?” of the blog “How do I breathe?”



**Fig. 5** Number of visualizations of the blog, by month and year, in the period from November 2014 to November 2017.

**Table 4** Search terms employed by the users and number of visits to the blog from each term surveyed

Search term	Number of visits
Unknown terms	26,410
“breathe through the mouth”	38
“where does the air we breathe go through”	21
“I breathe through the mouth”	21
“I cannot breathe through the nose”	19
“taste”	18
“mouth breathing”	12
“I cannot breathe through the nose, only through the mouth”	12
“pathway of the air”	12
“I only breathe through the mouth”	12

**Table 5** Pages in the blog with the greatest number of visits in decreasing order

Page in the blog	Number of visits
Why do people breathe through the mouth?	18,808
The pathway of the air we breathe	17,883
Breathing in sleep time	2,075
Why should we breathe through the nose?	2,050
About	861
The “flu voice” is related to breathing	852
Why do people snore?	423
How do we taste?	370
What can I do to breathe better?	219
Do I breathe well?	217

in the world and an excellent resource to provide information to the population.<sup>27</sup>

Within this context, this study developed a blog targeted to the young population (adolescents aged 13–18 years old), addressing the breathing function. This issue was selected due to the high rate of respiratory disorders observed in the Brazilian young population, especially those related to aller-

gic reactions, which affect the performance of other orofacial functions, craniofacial growth and school performance.<sup>1,5,8</sup> Therefore, the access to reliable information on breathing using an adequate language to this age group may be fundamental for health promotion and knowledge diffusion.

The creation of a website or weblog with health information requires care, attention and responsibility from the authors, and such material should be developed by professionals of the field, using scientific methodology to assure reliable results, encourage future studies and collaborate with the construction of knowledge. It should be highlighted that health information available on the internet may promote changes in habits and consequently change the lives of users who access such information.<sup>28</sup>

Thus, the method chosen to develop this blog was the instructional design model. This method was previously used in other studies that created blogs with health information, and the authors considered the method satisfactory to achieve their goals.<sup>24,25</sup>

The stages of analysis, design and development were more time consuming, since it was necessary to decide which subjects would be addressed, perform careful selection of information and adapt the content to a language accessible to the population. This was also found in a study that used the instructional design model.<sup>25</sup>

The blog format was selected for the stage of publication. This option for sharing health information on the internet had been previously used in another study with favorable results because it is a practical tool, accessible and easy to use,<sup>24,25</sup> considering the age range of the target population. The greatest difficulty at this stage concerned the esthetics of the blog, since an attractive design is fundamental to catch the attention of users and assure that browsing the blog would be pleasant.<sup>29</sup>

Due to the scarcity of studies on the population's knowledge about breathing and actions in health education on this subject, it was difficult to establish comparisons between research data and interpretation of results.

The number of views to the blog increased after August 2015. At that time, the study was presented and awarded during the 14<sup>th</sup> Congress of the Otolaryngology Foundation, which probably contributed to increase the visibility. Additionally, the blog was frequently used in clinical attendances for myofunctional rehabilitation, campaigns for prevention of mouth breathing and other events

related to speech-language pathology to raise the population awareness regarding the breathing function, increasing its diffusion. Concerning the highest number of views between June and November, the literature shows that airway disorders are more common in the cold seasons of the year,<sup>30</sup> which may have contributed to increase the search for information on the subject in these months.

Regarding the countries with the highest number of views, it was expected that Brazil would account for the highest percentage, since the study was prepared and diffused in the country. It should be noted that countries as Portugal, Angola and Mozambique have Portuguese as the official language, and the search terms employed by users were probably in this language, which enhanced retrieval of the blog. Visualizations from countries as United States, Germany, European Union, France and Japan may be related to Brazilians living abroad and looking for information on the internet in Portuguese.

The search terms employed, and the most viewed pages of the blog evidenced that users searched for information related to the causes of mouth breathing, aiming to understand the reasons why individuals breathe through the mouth rather than through the nose. When searching for health information on the internet, users commonly search for explanation for some symptom.<sup>28</sup>

The option of comments in the blog enhanced the communication between authors and visitors. This option is important, since it allows the professional to complement the information on the subject according to the individual's doubts and guide the search for a health professional for diagnosis and treatment, if necessary.

Continuing this study, the blog “How do I breathe?” will be evaluated by adolescents, using specific tools. Thus, based on the responses and suggestions from the target population, the content and means of presentation may be constantly updated and reformatted, maintaining the proposal of dissemination of knowledge about the breathing function.

The clinical practice for the young population demonstrates that the utilization of technological resources to explain and raise the awareness on breathing disorders encourages young individuals to achieve better treatment outcomes, since they may understand the problem and the importance of treatment and their compliance in the therapeutic process. Therefore, utilization of this material in practices of pediatricians, ear nose and throat doctors and speech-language pathologists is an awareness strategy that may be adopted by professionals.

Additionally, providing young individuals with information on breathing allows them to diffuse this knowledge to other individuals, enabling them to identify signs and symptoms of breathing disorders in themselves and in other people, thereby contributing to early diagnoses.

## Conclusion

The virtual page “How do I breathe?” was developed in blog format, targeted to the young population, containing infor-

mation about the breathing function, and is available in the internet address <https://comoeurespiro.wordpress.com>.

In the period from November 2014 to November 2017, there was a significant increase in the number of views from other countries; the search terms employed by users and the most viewed pages in the blog indicated interest in the definition and causes of mouth breathing, and the users employed the comments option to send compliments and questions.

## Note

This paper was presented at the **17th Congress of FORL** at São Paulo, SP, Brazil and was awarded as the third best among the papers presented in the category of Speech-Language Pathology.

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