Original articles

Design and development of the "Neonatal Tongue Screening Test" website

Elaboração e desenvolvimento de um website sobre o teste da linguinha

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Conflict of interest: non-existent

ABSTRACT

Purpose: to design the "Neonatal Tongue Screening Test" website.

Methods: an applied research based on the active website development was performed to provide information about the "Teste da Linguinha" (Neonatal Tongue Screening Test). The development of this study consisted of 3 stages: conceptualization, development and implementation. The conceptualization stage included the following definitions: the target audience, the aim, the analysis and the definition of the content based on a literature review on tongue-tie, infants' lingual frenulum assessment, and frenotomy. A text editor, scanner, and image editor were used for the web page development. The text editor used for the construction of the Web pages was Sublime Text. Chrome was the browser used to test the pages. The implementation phase consisted of publishing the website on the World Wide Web (WWW).

Results: the "Teste da Linguinha" website was published and has a registered domain. The content of the website - designed for parents / caregivers and health professionals - offers scientific information on tongue-tie and "The Neonatal Tongue Screening Test". The website has a responsive web design to allow desktop web page to be viewed in response to the size of the screen - tablet, smartphones - or web browser, without losing functionality. Responsive web design has become important as the amount of mobile traffic accounts for more than half of total internet traffic.

Conclusion: the "Teste da Linguinha" website was developed and can be accessed by entering the web address: http://www.testedalinguinha.com.

Keywords: Lingual Frenulum; Speech, Language and Hearing Sciences; Tongue; Medical Informatics

RESUMO

Objetivo: desenvolver um website sobre o "Teste da Linguinha".

Métodos: pesquisa aplicada, baseada no desenvolvimento ativo de um website com a finalidade de disponibilizar informações sobre o Teste da Linguinha. O desenvolvimento desse estudo consistiu de 3 etapas: conceituação, desenvolvimento e implementação. Para a etapa de conceituação foi definido o público-alvo, o objetivo, a análise e a definição do conteúdo por meio de revisão de literatura sobre anquiloglossia, avaliação do frênulo lingual em bebês e frenotomia. A etapa de desenvolvimento do website foi realizada por meio de editor de texto, digitalizador e editor de imagens. Para a construção das páginas Web foi utilizado o editor de texto Sublime. Para o teste das páginas em ambiente Internet foi selecionado o navegador Chrome. A fase de implementação envolveu a publicação do website na rede mundial de computadores.

Resultados: o website "Teste da Linguinha" encontra-se implementado com domínio já registrado. O conteúdo desse website é destinado a pais/cuidadores e profissionais da saúde, orientando sobre o teste e sobre a língua presa, com base em estudos científicos. O referido website foi elaborado com layout responsivo, podendo ser acessado em tablet, telefones celulares com acesso à internet e/ou em computadores, independentemente do sistema operacional, por meio dos principais navegadores disponíveis, sem perder a funcionalidade.

Conclusão: o website "Teste da linguinha" foi finalizado e pode ser acessado pelo endereço eletrônico www.testedalinguinha.com.

Descritores: Freio Lingual; Fonoaudiologia; Língua; Informática em Saúde

INTRODUCTION

In Brazil, the federal law 13.002 passed in 2014[1] states that all newborns in the country must undergo lingual frenulum assessment using the "Neonatal Tongue Screening Test" (NTST) before hospital discharge.

The NTST[2-3] – administered within 48 hours after birth – consists of the anatomo-functional evaluation of the "Lingual Frenulum Protocol for Infants" – LFPI[2,3].

The LFPI is a validated tool that assists with the diagnosis of movement restriction of the tongue due to frenulum alterations.

Although the law 13.002 has been passed, there are still newborns that do not undergo lingual frenulum assessment for several reasons. Educational actions could contribute for demonstrating the society the importance of early assessment to diagnose any tongue movement restriction that may interfere with the oral functions such as breastfeeding, chewing, swallowing, and speech.

Based on this reality, a website with useful information on the consequences of lingual frenulum alterations can be an effective tool to increase the knowledge of the population about the importance of the NTST.

The "World Wide Web" – abbreviated WWW or the Web – is an information space where resources and documents are identified by Uniform Resource Locators (URLs), interlinked by hypertext links, and accessed via the Internet[4].

The use of internet has grown allowing the population to easily access information. The internet has become an important channel of knowledge dissemination. All fields, including health, have implemented technological resources to promote health education; thus, internet is an excellent platform to spread knowledge[5-9].

To provide objectivity, reliability, and credibility of health information, "Health on the Net Code of Conduct" (HONcode) was created. The HONcode is a conduct code to guide web developers on how to design medicine and health websites by establishing principles to be followed[10]. When designing electronic media, ethical standards must be considered so the quality of content is reliable and the patients are not harmed[8].

The "Babies' Portal" was the first website to include guidelines on the NTST. The contents were evaluated by parents/caregivers and speech language pathologists. Concerning readability, both groups considered the content optimum, and there were positive results regarding the ownership, classification of purpose, authorship, author qualification, attribution, interactivity and updates[11,12].

The aim of this study was to design the "Teste da Linguinha" (The Neonatal Tongue Screening Test) website to provide information about assessment and consequences of lingual frenulum alterations.

METHODS

This is an applied research based on the active development of a website with the purpose of providing information about the NTST. Since the study does not involve human participants, ethical approval was not required.

Designed by a team of Speech Language Pathologists and professionals from the computing field, the website provides reliable scientific-based information that can be accessed using tablet, cellular phones and/or computers, without losing functionality.

The development of this study consisted of 3 stages: conceptualization, development and implementation.

The conceptualization stage included the following definitions: the target audience, the aim, the analysis and the definition of the content based on a literature review on tongue-tie, infants' lingual frenulum assessment, and frenotomy[2,3;13-19]. Subsequently, the website content was defined and organized. Texts and topics were written in plain language to ensure the reader understands as quickly, easily, and completely as possible.

Videos and images – with prior written authorization – were also added to the website for a better understanding of the content.

To guarantee the content quality of the website, the principles proposed by the HONcode were adopted[10]. The eight HONcode principles aimed to respect ethical and transparency criteria are: Authoritative, Complementarity, Privacy, Attribution, Justifiability, Transparency, Financial disclosure, and Advertising policy.

The development stage of the website consisted of the final project for earning a Bachelor's Degree in Computer Engineering at the Computer Systems Department of the Institute of Mathematical and Computer Sciences (ICMC-USP) – Web Development and Software Testing – from the University of Sao Paulo[20].

A computer with a Mac OS operating system was used. A text editor, scanner, and image editor were

used for the web page development (text, images and animations).

The text editor used for the construction of the Web pages was Sublime Text. Chrome was the browser used to test the pages.

The implementation phase consisted of publishing the website on the World Wide Web (WWW).

Finally, the domain was registered, a commercial internet service provider was contracted, and the information updated and published on the internet.

RESULTS

The "Teste da Linguinha" website was published and has a registered domain. It is available at the electronic address www.testedalinguinha.com.

The content of the website – designed for parents/caregivers and health professionals – offers scientific information on tongue-tie and the NTST.

The website has a responsive web design to allow desktop web page to be viewed in response to the size of the screen – tablet, smartphones – or web browser, without losing functionality. Responsive web design has become important as the amount of mobile traffic accounts for more than half of total internet traffic.

The website homepage contains 5 menus: about the test, photos, contact, downloads and FAQ.

It is also provides access to Law 13.002, as well as to the documents provided by the Federal Speech Therapy Council and the Brazilian Society of Speech Therapy (Fig. 1).

The item "About the test" (Sobre o teste) provides tongue–tie definition, possible consequences of tongue-tie and more info. The item "Photos" (Fotos) provides photos. The item "Contact" (Contato) provides an e-mail form to visitors to the website who want to contact. The item "Downloads" contains links to official documents and scientific research. The item "FAQ" lists questions and answers commonly asked. The menu items follow a didactic order in order to assist the understanding of information.

There is a scrollbar on the sides of the pages to help users interact with the content and flags that show the selected tab.

DISCUSSION

Since studies report that the internet consists of a relevant source of information on health[21], and an increased number of people have been looking for this kind of information on the internet, we decided to design a website to spread knowledge about the importance of The Neonatal Tongue Screening Test.

Given that the content of the website is designed for parents, caregivers, health professionals, and general audience, the texts are written in plain language for clearly communicating health information and keeping website engagement.

Additionally, the color scheme chosen for the website were: blue, light pink, black and white. The choice of the website colors was based on the literature[22] that reports about the influence of colors on public acceptance and response to the website.

Given the benefits to using video in education and the connection between visual clues, the memory process, and the recall of new knowledge reported in the literature, the website included videos, images and illustrations to facilitate learning[23-25].

The "Teste da Linguinha" website is a relevant tool since it provides basic information on tongue-tie and on the importance of early assessment to diagnose any tongue movement restriction that may interfere with the oral functions such as breastfeeding, chewing, swallowing, and speech.

Future studies aiming to evaluate the content presentation and quality of the "Teste da Linguinha" website as well as possible translations of the content into English and Spanish may contribute for increasing the number of users.

CONCLUSION

The "Teste da Linguinha" website was developed and can be accessed by entering the web address: http://www.testedalinguinha.com.
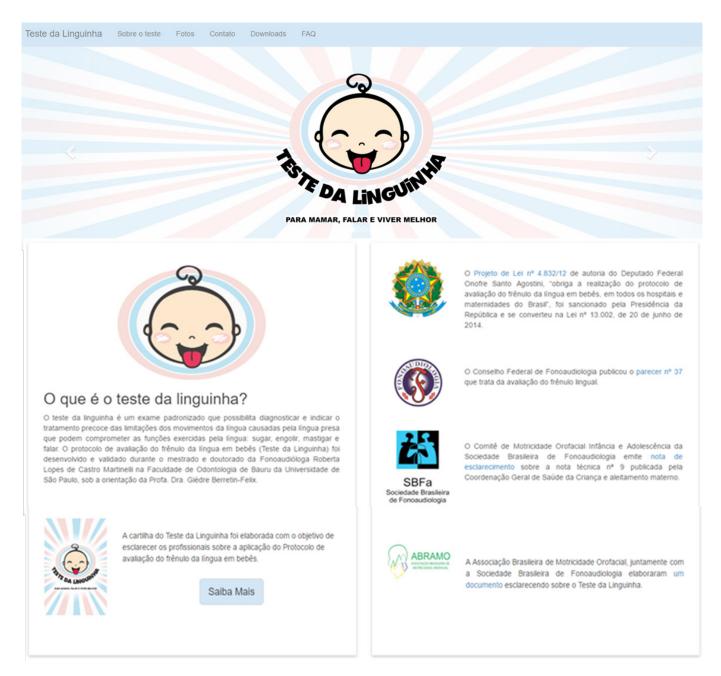
Figure 1. Homepage of the "Teste da Linguinha'' website

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