ANÁLISE DA ACESSIBILIDADE, ACESSOS E CERTIFICAÇÕES DAS INFORMAÇÕES DE UM FÓRUM VIRTUAL DE SAÚDE

ANÁLISIS DE ACCESIBILIDAD, ACCESO Y CERTIFICACIONES DE INFORMACIÓN DE UN FORO VIRTUAL DE SALUD

ACCESSIBILITY ANALYSIS, ACCESS AND CERTIFICATIONS OF INFORMATION FROM A VIRTUAL HEALTH FORUM

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RESUMO

Introdução: A Espinha Bífida (EB) é a mais frequente malformação congênita no mundo, sendo responsável por importantes sequelas neurológicas, compatível com a vida. Diante disso, faz-se necessário identificar e desenvolver tecnologias educacionais, que auxiliem na capacitação e no apoio a indivíduos com EB e seus familiares. Nessa direção, foi desenvolvido um fórum virtual para indivíduos com EB e seus familiares, o MieloFórum.

Objetivo: A proposta deste estudo é avaliar os acessos, a acessibilidade dos seus usuários e garantir uma certificação de qualidade ao mesmo.

Método: Para a análise de erros de HTML foram coletados os erros de acessos do MieloFórum, analisado os acessos e submetido a uma certificação de qualidade.

Resultados e discussões: o fórum foi desenvolvido e avaliado, sendo encontrado o total de 28 problemas no código do fórum, levando em consideração as regras de padronização do World Wide Web Consortium mostrou-se abrangente em acessos no período analisado e submetido a certificação de qualidade. Foram mais de 1500 acessos em 7 meses com uma demanda em diversos países.

Conclusão: A submissão do MieloFórum em uma ferramenta de análise da acessibilidade mostrou-se útil para o julgamento e a correção dos problemas identificados, potencializando-o juntamente com a certificação de qualidade.

Descritores: Reabilitação, Acesso aos Serviços de Saúde, Fórum de Saúde.

RESUMEN

Introduccíon: La Espina Bífida (EB) es la más frecuente malformación congénita en el mundo, siendo responsable por importantes secuelas neurológicas, compatible con la vida. Por eso, se hace necesario identificar y desarrollar tecnologías educativas, que ayuden en la capacitación y en el apoyo a individuos con EB y sus familiares. En esa dirección, se desarrolló un foro virtual para individuos con EB y sus familiares, el MieloFórum.

Objetivo: La propuesta de este estudio es evaluar los accesos, la accesibilidad de sus usuarios y garantizar una certificación de calidad al mismo.

Método: Para el análisis de errores de HTML fueron recolectados los errores de accesos de MieloFórum, analizado los accesos y sometido a una certificación de calidad.

Resultados y Discusiones: el foro fue desarrollado y evaluado, encontrando el total de 28 problemas en el código del foro, teniendo en cuenta las nuevas reglas de estandarización del World Wide Web Consortium, se mostró amplio en accesos en el período analizado y sometido a certificación de calidad . Fueron más de 1500 accesos en 7 meses con una demanda en diversos países.

Conclusíon: La sumisión del MieloFórum a una herramienta de análisis de la accesibilidad resultó útil para el juicio y la corrección de los problemas identificados, potenciándolo junto con la certificación de calidad

Palabras clave: rehabilitación, acceso a servicios de salud, foro de salud.

ABSTRACT

Introduction: Spina Bifida (SB) is the most frequent congenital malformation in the world, responsible for important neurological sequelae, compatible with life. Given this, it is necessary to identify and develop educational technologies, which help in the training and support to individuals with SB and their families. In this direction, a virtual forum was developed for individuals with SB and their relatives, MieloForum.

Objective: The purpose of this study is to evaluate the accesses, the accessibility of its users and to guarantee a quality certification to the same.

Method: For the analysis of HTML errors, the access errors of MieloForum were collected, the accesses analyzed and submitted to a quality certification.

Results and Discussions: The forum was developed and evaluated, and a total of 28 problems were found in the forum code, taking into account the new rules of standardization of the World Wide Web Consortium, it was comprehensive in accesses in the analyzed period and submitted to quality certification . There were more than 1500 accesses in 7 months with a demand in several countries.

Conclusion: MieloForum's submission to an accessibility analysis tool proved to be useful for judging and correcting identified problems, enhancing it together with quality certification.

Keywords: Rehabilitation, Access to Health Services, Health Forum

INTRODUCTION

MieloForum was developed by a group of researchers and health professionals from universities in Brazil and Germany, with experience in the rehabilitation of people with Myelomeningocele (MMC), where they had the idea of making a virtual forum for Brazilians with MMC, based on a German model (just like it exists in Germany), in order to help people exchange information to share doubts, knowledge, difficulties and experiences, creating a support and learning network.

Accessibility in web tools refers to the inclusive practice of making websites that can be used by all people with or without disabilities. When websites are properly designed, developed and edited, all users can have equal access to information and functionality. Access in a web tool, on the other hand, refers to how easy it is for a user to go from one page to another within your tool. There is also the interaction between users, which refers to the ability to have a social interaction within the forum and how efficient it is[1].

Currently, the population searches for health information on the internet. Therefore, health researchers are concerned about promoting and disseminating quality health information. In this sense, in 1995, after a conference on health and the internet, held in Geneva, Switzerland, a foundation called Health on the Net Foundation (HON) was created, founded to encourage the dissemination of quality health information to patients, professionals and the public in general, and to facilitate access to the latest health data via the internet. HON created a code to establish an ethical standard, issuing certification for healthcare websites: the HONcode[2].

HONcode certification is a code of ethics that aims to ensure the dissemination of quality health information. It certifies a website's intention to publish transparent and quality information. Thus, HONcode guides website managers in creating a minimum set of mechanisms to provide objective and transparent medical quality information tailored to the needs of the public. Websites in the healthcare area that request certification and websites that are already certified are committed to respecting the HONcode and requirements for certification.

Possession of the HONcode stamp allows a website to demonstrate its intention to contribute to quality healthcare information by publishing objective and transparent information[2].

To receive the certification, it is necessary to comply with the 8 principles of HONcode, they are:

Principle 1 - Authority: All medical or health advice hosted and provided on the website will be given only by trained and qualified professionals, unless a clear statement is made that the advice offered is from an individual not qualified in the medical field or organization.

Principle 2 – Complementarity: the information provided on this website is intended to support, and not to replace, the relationship that exists between a patient/website visitor and her/his existing physician.

Principle 3 – Confidentiality: Privacy of data relating to patients and individual visitors to a medical/health website, including their identity, is respected by this website. Those responsible for the website are committed to honor or exceeding the legal privacy/medical information requirements that apply in the country and state where the Website and its mirrors are located.

Principle 4 – Attribution: if it is applicable, the information contained in the website will be supported by clear references to the consulted sources, and, when possible, with HTML links to these sources. The date each medical page was last modified will be displayed clearly (eg: at the bottom of the page).

Principle 5 - Justifications: Any claims made about the benefits and/performance of a specific treatment, product or commercial service will be supported by adequate, balanced evidence as indicated in Principle 4.

Principle 6 – Transparency: website designers will seek to display information as clearly as possible and provide contact addresses for visitors who want additional information or help. The webmaster will display his email address clearly throughout the website.

Principle 7 - Financial Disclosure: Contributions to this website will be clearly identified, including the identity of commercial and non-commercial organizations that have contributed funding, services or material to the website.

Principle 8 – Advertising: if advertising is a source of funding, this should be clearly stated. A brief description of the disclosure policy adopted by the website owners will be displayed on the website. Advertisements and other promotional materials will be presented to visitors in a manner and context that makes it easy to differentiate them from the original material produced by the website's managing institution.

For online collaborative platforms, such as the virtual forum, in addition to the eight principles mentioned above, privacy and messages are also evaluated.

The development of a tool that allows the dissemination of quality health information and the exchange of experiences among users, such as a virtual forum, brings the responsibility to ensure that this information is passed on with quality for the real intention of serving as support to the population, with that in mind, this study aims to analyze access, accessibility and certify the information of a virtual health forum

METHOD

This study is a descriptive research. For being a project with free access data and without the possibility of identifying the participants, thus there was not the approval of the research ethics committee.

The accessibility check was carried out using the Web Accessibility Checker, a web evaluation tool that helps developers to evaluate the source code of their websites[1]. AChecker uses the standards detailed in the World Wide Web Consortium, the main international standardization organization for the World Wide Web (WWW, World Wide Web)[3]. With AChecker, a scan was carried out in the source code, page by page of the MieloForum, checking the problems and potential problems. After this scan, the tool issued a report identifying the problems and potential problems. The data was organized and analyzed with the help of a programming language PHP (Hypertext Preprocessor) and the Excel program.

HON recommends that the quality of websites should be certified by a neutral organization based on quality criteria, such as HONcode[6]. MieloForum's certification by Health on the Net Foundation was carried out after its submission to the Health on The Net Code on the HON website and obtaining the certification seal, with annual reassessment. The certification and reassessment processes are illustrated in figure1.

Web indicators allow measuring and evaluating scientific and technical activities, where several indicators can be built and analyzed, such as: size or number of objects in a web space in countries, regions, organizations, people, in terms of content; examination of connections between pages and sites; quantity and characteristics of visits each site receives; network density; number of visits received by a website; number of links received[7]. For the statistical analysis, the Google analytics tool was used, which is a free tool that allows you to obtain statistics from a website or virtual store in order to understand the behavior of users. The website was analyzed from the period of public availability November 28, 2014 to June 30, 2015.

RESULTS

Development of the virtual forum: the forum was built on the PhpBB system (forum management system for the Internet), using PHP scripts, as well as the German forum that collaborated with this study. A customized version of the style was used, set of group of images, templates and themes, coffee time. The customization was carried out with the objective of making it easier to navigate and understand the forum users.

The customization went through the following steps: customization of buttons and tabs, choice of colors and inclusion of MODs (modifications to the forum). Highlighting the constant updating of the forum, the MODs added so far were: Private_Message_Moderation button, used to control the private message among forum users, and FAQ_Manager, used to facilitate changes to the frequently asked questions page.

Along with the changes, the inclusion of theoretical material on the topic of the forum (MMC, intermittent vesical catheterization, among others) began to be made, considering the dynamics and ease of language for the target audience.

To analyze accessibility, the Web Accessibility Checker (AChecker) tool was used. This tool checks individual HTML pages for compliance with accessibility standards to ensure the content is accessible to everyone.

After the analysis, 28 problems were found with the forum code, as shown in table 1.

The problems identified on each page will be described below, followed by the analysis and corrections carried out:

Page 1: Seven issues were found with the forum code:

From the first to the sixth were problems with the <b> code (bold in html). The Web Accessibility Checker currently uses HTML5 bases for accessibility assessment, that is, it is claiming that it should be modified in the source code, every <b> (bold in html) by <strong> (bold in HTML5). However, as we are using a tool, phpBB, which is made to facilitate both user navigation and possible changes in the forum through future administrators and moderators, the ideal is to keep the standard of the phpBB tool. Thus, after the analysis, no corrections were needed for these 6 identified problems.
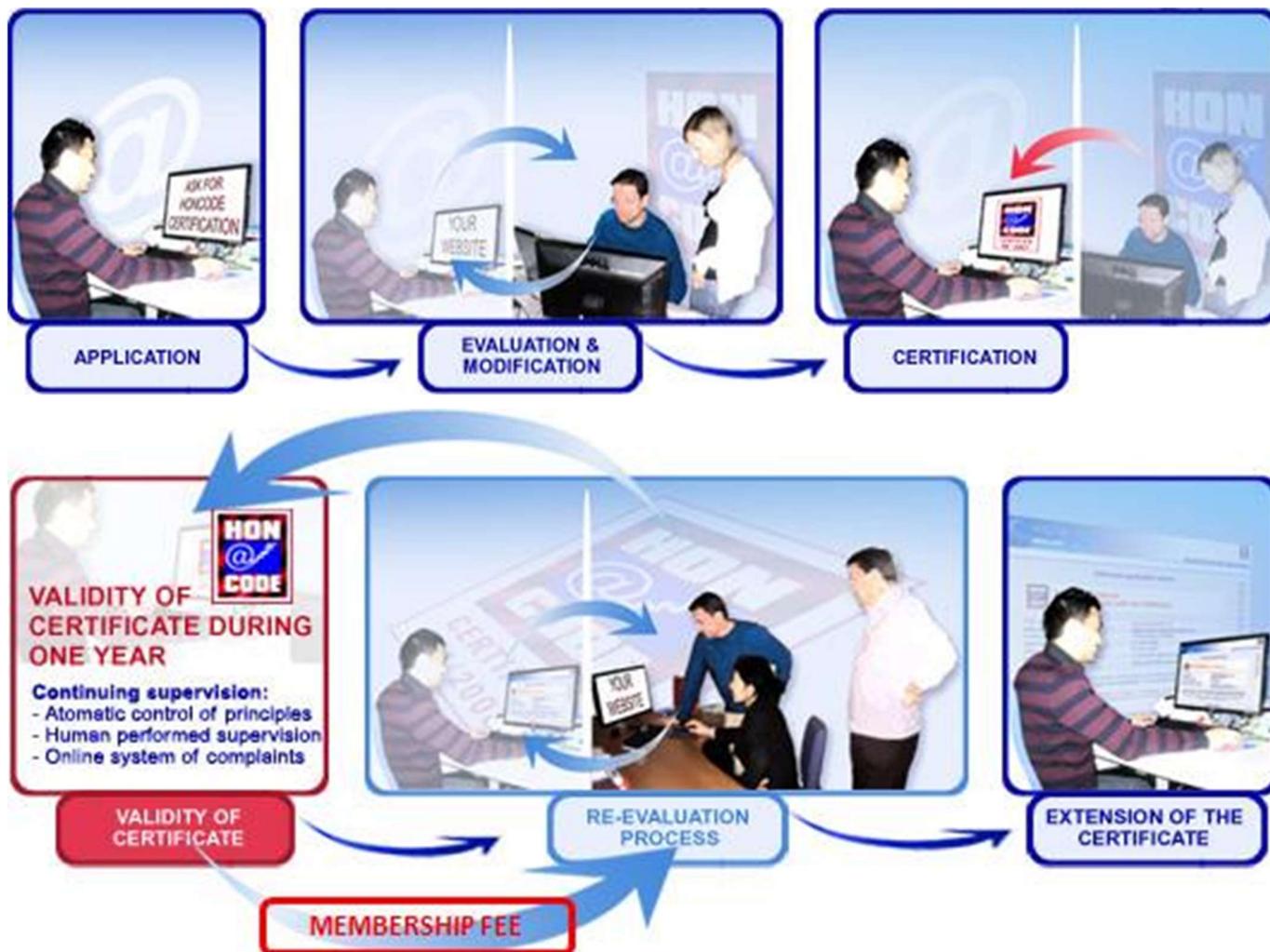
Figure 1 - *HON Certification Process*

Number and name of page	Problems
1. Forum index	7
2. Enter	0
3. Register	0
4. More usual questions	5
5. Welcome to "MieloForum"	0
6. MieloFórum/Discussions	0
7. Information on MieloFórum	8
8. Terms of use MieloFórum	0
9. Who we are	0
10. Contact	0
11. Know more about Mielomeningocele	8
12. What is Spina Bifida?	0
13. What is Neurogenic Bladder?	0
14. Intermittent Vesical Catheterization	0
15. Urinary infection and intermittent bladder catheterization	0
15 pages	**28**

Table 1 – *Distribution of MieloFórum pages according to the problems identified in the AChecker evaluation. Survey conducted in a virtual environment, 2014 . Source: AChecker*

The seventh problem was with the <h1> code (header or title in html) claiming it was empty. After analyzing, it was found that the <h1> is one of the possible modifications that can be done through a phpBB tool, the ACP (Administration Control Panel). So a fix would be needed, however we chose to use the forum logo as the title. Also, as the forum may be modified in the future, for updates and adaptations to its audience, removing the codes <h1> would be removing this utility from our tool.

Page 4: Five issues were found with the forum code:

The first through the fifth were problems with the <i> code (italics in html). The Web Accessibility Checker currently uses HTML5 bases for accessibility assessment, that is, it is claiming that it should be modified in the source code, all the <i> (italics in html) by <em> (bold in HTML5). But as we are using a tool, phpBB, which is made to facilitate both user navigation and possible changes in the forum through future administrators and moderators, we chose to keep the standard of the phpBB tool and not make any changes.

Page 7 and 11: We found eight problems with the forum code:

From the first to the eighth were problems with the <b> code (bold in html). The Web Accessibility Checker currently uses HTML5 bases for accessibility assessment, that is, it is claiming that it should be modified in the source code, every <b> (bold in html) by <strong> (bold in HTML5). But as we are using a tool, phpBB, which is made to facilitate both user navigation and possible changes in the forum through future administrators and moderators, we chose to keep the standard of the phpBB tool and not make any changes.

Pages 2,3,5,6,8,9,10,12,13,14 and 15:

No problems were found.

AChecker also highlighted the possible problem with naming our objects in CSS (Cascading Style Sheets - a style sheet language used to define the presentation of documents written in a markup language such as HTML), claiming that objects have titles irrelevant, however these titles are used by the ACP to provide an easier way for administrators to change the forum.

MieloForum Certification by HONcode: the forum was submitted to HONcode certification, the Health On the Net Foundation's initiative to improve the quality of medical information on the Internet. The website was viewed and evaluated for compliance with the HONcode principles and the following modifications/changes needed to be made:

Principle 3 – Confidentiality – Creation of a description or a page containing the privacy policy of the data collected by the website. A page was created in the forum with the name: "MieloForum Terms of Use" with all the confidentiality and use policy of the forum.

Principle 7 - Source of Funding - How is the website financed? - Clearly indicate how your website is funded. A page was created in the forum with the name: "Partners" with all the funding to MieloForum.

Principle 8 - Honesty in advertising and editorial policy - It must be clearly stated that the website does not have advertising links or banners. The phrase: "MieloForum currently does not have any form of advertising" was added on the "Partners" page.

Health 2.0 Principles - Apply to online collaborative platforms, such as virtual forums. Following this principle, four more items were added to the "MieloForum Terms of Use", offering clarification to the user regarding the privacy, messages, complementarity and authority of MieloForum. All corrections suggested by HON's certifiers were carried out and the certification request was resent and granted in March.

The MieloForum accesses/sessions data were categorized according to table 2.

Accesses	1,548
Users	938
Page views	8,574
Rejection rate	57.04%
Percentage of new sessions	60.34%
Page/Session	5,54%

Table 2: *MieloFórum access/session data. Survey conducted in a virtual environment, 2014. Source: Google Analytics*

We observe in Table 2 that MieloForum obtained in its analysis period 1,548 sessions, with 938 users, 8,574 page views and an average rejection rate of 57.04%, which means that the new user was connected to the MieloFórum page for less than 3 minutes, 60.34% of new sessions and an average of 5.54 pages per session.

The distribution of sessions in MieloForum is categorized according to the number and origin (country) of accesses, as shown in table 3.

Country	Accesses	%
Brazil	671	43
Germany	293	18.93
Russia	133	8.59
The United States	126	8.14
China	123	1.94
Portugal	30	1.61
Japan	25	1.16
South Korea	18	0.78
Netherlands	12	0.78
India	12	0.71
Canada	11	0.52
England	8	0.52
Angola	8	0.39
Taiwan	6	0.39
Italy	6	0.32
Other countries	5	3.41
Not Set	61	7.95
Total of Accesses	**1548**	**100**

Table 3: *Distribution of sessions to MieloFórum according to the country of access. Survey conducted in a virtual environment, 2015. Source: Google Analytics*

It can be seen in Table 3 that Brazil leads the number of accesses to MieloForum as expected with 43% of accesses, with 7.95% the number of accesses from computers not identified by Google analitycs by their country of origin, Germany obtained 18, 93% of accesses followed by Russia (8.59%), United States (8.14%), China (1.94%), Portugal (1.61%), Japan (1.16%), South Korea (0.78%), Netherlands (0.78%), India (0.71%), Canada (0.52%), England (0.52%), Angola (0.39%), Taiwan (0 .39%), Italy (0.32%) and other countries with 2 accesses or less added up (3.41%) of accesses to MieloForum.

The word "not set" displayed in the Google Analytics tables below means that the website receives traffic from a Google AdWords account that is not linked to viewing reports, ie the IP is not recognized by the system.

The distribution of sessions on MieloForum from Brazil is categorized according to the number of accesses and the corresponding state, as shown in table 4.

States	Accesses	%
São Paulo	251	37.41
Minas Gerais	86	12.82
Paraná	64	9.54
Rio de Janeiro	63	9.39
Santa Catarina	33	4.92
Rio Grande do Sul	22	3.28
Distrito Federal	15	2.24
Piauí	15	2.24
Goias	14	2.09
Para	14	2.09
Bahia	12	1.79
Ceará	12	1.79
Mato Grosso do Sul	11	1.64
Pernambuco	11	1.64
Maranhão	7	1.04
Paraíba	7	1.04
Rio Grande do Norte	6	0.89
Mato Grosso	5	0.75
Amazonas	4	0.60
Espírito Santo	4	0.60
Amapá	4	0.60
Sergipe	3	0.45
Roraima	1	0.15
Tocantins	1	0.15
Acre	1	0.15
Not Set	5	0.75
Total	**671**	**100**

Table 4 – Distribution of sessions to MieloFórum in Brazil according to access status. Survey conducted in a virtual environment, 2015. Source: Google Analytics

According to table 4, São Paulo is the state with the highest number of accesses to MieloForum with 37.41% of accesses, followed by Minas Gerais (12.82%), Parana (9.54%), Rio de Janeiro (9, 39%), Santa Catarina (4.92%), Rio Grande do Sul (3.28%), Federal District (2.24%), Piaui (2.24%), Goias (2.09%), Pará (2.09%), Bahia (1.79%), Ceará (1.79%), Mato Grosso do Sul (1.64%), Pernambuco (1.54%), Maranhão (1.04%), Paraíba (1.04%), Rio Grande do Norte (0.89%) Not Set (0.75%), Mato Grosso (0.75%), Amazonas (0.60%), Espirito Santo (0.60 %), Amapá (0.60%), Sergipe (0.45%), Roraima (0.15%), Tocantins (0.15%), Acre (0.15%).

Most accesses came from computers (79.97%), while 18.48% of accesses were from cell phones and 1.55% from tablets.

DISCUSSION

The development of a virtual health tool that seeks to be accessible and appropriate, both for people with MMC and their families, favors access to information about the malformation and the exchange of experience among users, increasing knowledge and allowing the formation of a network of mutual support. In this sense, it is important to consider that, in addition to encouraging the population and professionals to use technologies, family members/caregivers should be considered and their participation included[8].

The forum manager system for the Internet that is being used, phpBB, is an old platform and it has some problems with the new WW3 standards and consequently AChecker. The style used was developed by the phpBB community, however, not all desired changes were allowed during forum development, as platform support is limited.

The internet presents an extensive content of health information available to a diverse population, which can present the most different skills and requirements[4,9]. In addition to the search for information, people seeking information want to share their concerns and experiences[10].

Thus, ensuring accessibility to all users is a challenge, even though there is an extensive set of recommendations made available by the World Wide Web Consortium[3]. Thus, different tools for accessibility assessment are proposed, which compare artifacts to guidelines in order to obtain automated results, producing tests and generating various data, such as the location of the problem in the code and the specified flaws[4]. Processing these data, through the availability of a common language, AChecker was used to review the accessibility of Web pages based on a variety of international accessibility guidelines. According to the results, it was observed that the PhpBB platform used did not allow all the changes indicated by AChecker and, therefore, it would be recommended to transport MieloForum to a more modern platform.

The recognition of the central role of the Internet as a source of health information has generated a growing concern with the quality and transparency of this information obtained by the population[11-12]. In response to these concerns, a series of initiatives have been developed to establish quality criteria for health-related websites and to help users find quality information. In this direction, MieloForum was submitted, the quality labeling, carried out by the HON, with a focus on ethical standards related to online publication. Since HON recommends that the quality of websites must be certified by a third and neutral organization, according to quality criteria such as HONcode.[2,4]

MieloForum's certification by HONcode was extremely productive, as it allowed modifications to the tool, essential for its adequacy, raising it to international standardization. It is noteworthy that the same concern with certifying virtual tools was demonstrated by other researchers, who used HONcode[4,11,12].

People with disabilities or chronic illness are more likely to use the internet to access websites with health information. In addition to seeking information, information seekers want to share their afflictions and experiences.

Access to the MieloForum webpage was made available to the public from November 22, 2014, with a low number of accesses due to continuous maintenance to improve it and lack of dissemination until February 28, 2014, when it was created MieloForum's official page on the most used web relationship page today, Facebook, where accesses have been growing continuously, reaching 1,548 accesses and reaching 50 different countries in just 5 months, covering a varied audience and from different regional locations such as São Paulo, Belo Horizonte, Rio de Janeiro and Paraná, and international countries including countries such as the USA, Germany and several others as shown in Table 3, demonstrating the great demand and interests of patients with Spina Bifida. The rejection rate shown at 57.04% is due to the fact that the Forum is currently only available in Portuguese, and a large number of accesses were of an international level, causing great difficulty for users and preventing them from continuing to access the information available.

It was observed that 20.03% of accesses to MieloForum were from mobile devices (cell phones or tablets). The number of people who reported accessing the internet using their cell phone grew 65% in the last year[13], which shows a possible need to create an application to facilitate access via mobile networks.

CONCLUSION

The development of a tool that allows the dissemination of quality health information and the exchange of experiences among users, such as a virtual forum is always a challenge, especially when this tool is aimed at an audience with physical and cognitive limitations, such as individuals with Spina Bifida.

In this sense, the analysis of accessibility, with AChecker, was essential to guarantee and to facilitate the access of the target audience of this virtual health forum, in addition to indicating the need to transfer the platform used. The certification by HONcode elevated MieloForum to an international standard, aiming at the transparency and clarity of health information, providing the user with security when using the forum.

Following the idea of innovation and new information technologies, a tool like MieloForum has a lot to grow, requiring continuous maintenance and improvement to clarify and provide users with quality health information. Due to access from other countries, the

great importance of providing an English version was observed, in order to increase access and decrease the rejection rate of users who do not speak Portuguese.

The forum is a privileged space for discussions and debates; it is a very versatile communication tool. It's a space where everyone can see what everyone else is doing, even if not at the same time. In the teaching and learning process, the benefits consist of the meta-cognition process where the participant, when expressing their ideas, needs to organize them clearly and objectively and finally analyze what they have learned, thus becoming a bank of information. Participating in forums allows us to learn, teach and establish relationships with other people[10].

The development of a forum is always a challenge, and the high number of accesses shows the importance and demand of bringing people with spina bifida a virtual tool that allows the clarification of doubts about health and the opportunity for interaction, as well as sharing of experiences. MieloForum proved to be not only a source of information on health, but also a network of mutual support for this population.

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