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EVALUATING THE USABILITY OF AN INFORMATION PORTAL FROM THE PERSPECTIVE OF ITS USERS

*AVALIAÇÃO DA USABILIDADE DE UM PORTAL DE INFORMAÇÕES
NA PERSPETIVA DOS SEUS USUÁRIOS*

*EVALUACIÓN DE LA USABILIDAD DE UN PORTAL DE INFORMACIÓN DESDE
LA PERSPECTIVA DE SUS USUARIOS*

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ABSTRACT

Background: The internet has been widely used for the dissemination of information. In this sense, the usability of virtual environments, characterized by ease of access and navigation, becomes essential, especially for vulnerable audiences such as people with disabilities.

Objective: This study analyzed the usability of Portal D+Informação from the perspective of its users.

Methods: This is a quantitative, cross-sectional, descriptive and analytical study. To collect data on the usability of the Portal, a virtual questionnaire was used with questions related to navigation, interface and language.

Results: The main reason for accessing the Portal was searching for information (83.33%). Regarding usability, 96.70% reported ease of navigation, 80.00% rated the language as excellent, 73.33% declared the visuals excellent and 73.33% maintained the overall rating as excellent; 76.60% declared that the Portal brought something new and 100.00% of participants would recommend the Portal.

Discussion: Previous studies point to the internet as the search mechanism for health information most chosen by people due to the ease of access and variety of references available for reading. A study on the analysis of accessibility, certification and access to a virtual Forum demonstrated that a virtual environment based on scientific evidence becomes a strong source of access to health information and exchange of experiences.

Conclusions: This study corroborated to include the assessment of people with disabilities, family members and professionals in the development of assistive technologies. The evaluation of the portal was positive in relation to the requirements of ease navigation, providing new information and friendly interface.

Descriptors: Social network, Internet Access, Rehabilitation nursing, Health Services Accessibility

RESUMEN

Introducción: Internet ha sido ampliamente utilizado para difundir información. En este sentido, la usabilidad de los entornos virtuales, caracterizados por la facilidad de acceso y navegación, se vuelve fundamental, especialmente para públicos vulnerables como las personas con discapacidad.

Objetivos: Este estudio analizó la usabilidad del Portal D+Informação desde la perspectiva de sus usuarios.

Metodos: Se trata de un estudio cuantitativo, transversal, descriptivo y analítico. Para recoger datos sobre la usabilidad del Portal se utilizó un cuestionario virtual con preguntas relacionadas con la navegación, la interfaz y el idioma.

Resultados: El principal motivo de acceso al Portal fue la búsqueda de información (83,33%). En cuanto a la usabilidad, el 96,70% reportó facilidad de navegación, el 80,00% calificó el lenguaje como excelente, el 73,33% declaró excelente el aspecto visual y 73,33% mantuvo la calificación general como excelente; 76,60% declaró que el Portal aportaba algo nuevo y el 100,00% de los participantes recomendaría el Portal.

Discusión: Estudios previos señalan a Internet como el mecanismo de búsqueda de información en salud más elegido por las personas debido a la facilidad de acceso y variedad de referencias disponibles para lectura. Un estudio sobre el análisis de accesibilidad, certificación y acceso a un Foro virtual demostró que un entorno virtual basado en evidencia científica se convierte en una fuerte fuente de acceso a información en salud e intercambio de experiencias.

Conclusiones: Este estudio corroboró incluir la evaluación de personas con discapacidad, familiares y profesionales en el desarrollo de tecnologías de asistencia. La evaluación del portal fue positiva en relación a los requisitos de facilidad de navegación, provisión de nueva información y interfaz amigable.

Descriptoros: Red social, Acceso a internet, Enfermería en Rehabilitación, Accesibilidad a los Servicios de Salud

RESUMO

Introdução: A internet tem sido amplamente utilizada para a divulgação de informações. Nesse sentido, a usabilidade dos ambientes virtuais, caracterizada pela facilidade de acesso e navegação, torna-se essencial, principalmente para públicos vulneráveis como as pessoas com deficiência.

Objetivos: Este estudo analisou a usabilidade do Portal D+Informação na perspectiva de seus usuários.

Métodos: Trata-se de um estudo quantitativo, transversal, descritivo e analítico. Para coletar dados sobre a usabilidade do Portal, foi utilizado um questionário virtual com questões relacionadas à navegação, interface e idioma.

Resultados: O principal motivo de acesso ao Portal foi a busca de informações (83,33%). Em relação à usabilidade, 96,70% referiram a facilidade de navegação, 80,00% endossam a linguagem como excelente, 73,33% a declaram o visual como excelente e 73,33% mantêm a avaliação geral como excelente; 76,60% declararam que o Portal trouxe novidades e 100,00% dos participantes indicaram o Portal.

Discussão: Estudos anteriores contam com a Internet como mecanismo de busca de informações em saúde mais procurado pelas pessoas, devido à

facilidade de acesso e variedade de referências disponíveis para leitura. Um estudo sobre análise de acessibilidade, certificação e acesso de um Fórum virtual, demonstra que um ambiente virtual baseado em evidências científicas torna-se uma forte fonte de acesso à informação em saúde e troca de experiências.

Conclusões: Este estudo corroborou ao incluir a avaliação de pessoas com deficiência, familiares e profissionais no desenvolvimento de tecnologias assistivas. A avaliação do portal foi positiva em relação aos requisitos de facilidade de navegação, disponibilização de novas informações e interface amigável.

Descritores: Rede social, Acesso à internet, Enfermagem em Reabilitação, Acessibilidade aos serviços de saúde

INTRODUCTION

Thanks to the ease with which it can be accessed at any time, and its geographical outreach, the internet has been widely used as a resource for the dissemination of health information in virtual environments⁽¹⁾. According to the Regional Center for Studies for the Development of the Information Society (Cetic.br) there was an increase in the number of internet accesses by the Brazilian population from 2019 to 2021, where 82% of the surveyed households used the internet⁽²⁾. With the SARS-CoV-2 (COVID-19) pandemic, there was an increase in searches for information online, as well as sharing of information⁽¹⁾. As more people use the internet, this contributes to scientific research being disseminated to a greater number of people in different regions, by overcoming physical barriers⁽³⁻⁴⁾.

In addition, the practicality of obtaining information anywhere and at any time of day helps people with limited mobility or transportation difficulties to have access to professional guidance, without the need to visit a healthcare facility, for example⁽¹⁾. In virtual environments, usability is understood as the ease of finding search results. Likewise, websites with indicators of difficulty of access and navigation correspond to fragile interactions and difficulty attracting users. Usability is a fundamental tool for evaluating the user's perspective⁽⁵⁾.

The ease of access to online information helps people search for various topics, including health. It should be observed that the information available may be scientific in nature or contain false content (fake news), whereby the reader may pass on and follow these publications in a positive or negative way⁽⁶⁻⁷⁾. In order to meet the need for quality information, based on scientific evidence, the D+Informação Portal was developed by researchers at the *Núcleo de Pesquisa e Atenção em Reabilitação Neuropsicomotora* (Center for Research and Care in Neuropsychomotor Rehabilitation - Neurorehab), in partnership with the University of Dortmund, Germany.

Additionally, the practicality of obtaining information at any geographic reach and at any time, helps people with mobility difficulties and transportation resources to have access and professional guidance without the need to go to a health service, for example⁽¹⁾. Usability in virtual environments is understood as the ease of finding search results. Being that, the indicative of difficulty of access and navigation, correspond to the fragility for interaction and capture of users in sites. Usability is a fundamental tool for evaluating the user's perspective⁽⁵⁾. The usability assessment to certify that the content presented is satisfactory and easily accessible to the target audience, minimizes the number of tabs and subcategories to find the information⁽⁸⁾. The inclusion of users in the usability assessment of websites optimizes the development process. And it contributes to greater satisfaction and accessibility of information, especially for vulnerable audiences such as people with disabilities^(8,9).

Despite this, there are few studies that evaluate the usability of virtual information tools for people with disabilities. Studies on assistive technologies that seek inclusion must necessarily include the assessment of people with disabilities, family members and professionals in their assessment. Aiming at the adequacy of these tools to this vulnerable and specific target audience. In this way, the present study aims to analyze the usability of the D+Informação Portal from the perspective of its users, aiming at the improvement and adequacy of this virtual tool for its target audience.

METHODOLOGY

This is a quantitative, cross-sectional, descriptive, and analytical study. This study was reviewed and approved by the Brazilian Ethics Committee CAAE: 07355319.9.0000.5393.

After development, international certification of the health information and prior validation by experts, the Portal was made available (<https://demaisinformacao.com.br/>)⁽⁹⁾. The D+Informação Portal was launched from a computer room at the host university, with several nurse researchers sending the virtual launch folder containing the Portal's uniform resource locator (URL) throughout Brazil. The launch folder was sent through groups on the social networks, such as, Facebook®, Instagram®, and WhatsApp®. In addition, publications were created by nurse researchers who are members of the research group, on the Neurorehab and D+Informação social networks, followed by a tutorial on how to navigate the Portal. The Portal provides the option for visitors to register as users to receive weekly news and updates (<https://pt.surveymonkey.com/r/Y6GHVTF>).

The registration recruitment period started from the launch of the Portal, where it was launched in October 2019. Weekly e-mails with news of the most

recent publications were sent out to users registered on the Portal as a way to invite people to return to the Portal and access the information published, with a view to providing greater familiarity with the Portal for later evaluation. The topics chosen for the Portal's publications were related to the interests of populations with greater difficulty in accessing information, such as persons with disabilities (PwD), their families, and health professionals. Moreover, the content was previously reviewed by the editor-in-chief, a doctoral professor and leader of Neurorehab.

The sample inclusion criteria was: Users who voluntarily registered on the D+Informação portal, over 18 years of age.

The sample exclusion criteria was participants who were under 18 years of age and members of the Neurorehab who had registered on the Portal.

After the period of recruitment of registrations in Portal D+Informação, the initial sample consisted of 255 people registered in D+Informação. Of these, 32 records of people who were under 18 years of age and members of the Neurorehab research group were excluded. As a result, the total number of people registered in accordance with the terms of recruitment was 223 users registered in D+Informação.

After that, invitations to participate in the research were sent, via e-mail and WhatsApp® messages, to the 223 selected users registered in D+Informação. Thus, according to the established criteria, the sample consisted of 30 participants who accepted and agreed to participate and evaluated the usability of D+Informação.

To evaluate the usability of access to the Portal, a virtual questionnaire (<https://pt.surveymonkey.com/r/BP3Q7Q6>) was used with questions related to navigation through the Portal, a means that the user knew about the existence of the Portal, usefulness and acquisition of new knowledge, as well as the indication of the Portal, previously used and validated in previous studies by the Neurorehab research group⁽¹⁰⁻¹¹⁾. On the last page, the participant was redirected to the D+Informação Instagram® social network (<https://instagram.com/demaisinformacao?igshid=dqf8nld7pob7>).

demaisinformacao?igshid=dqf8nld7pob7).

It is noteworthy that during the data collection process, people could already enjoy the content published weekly on D+Informação, where the scientific production of this study for the community could be used from the stage of its development.

Data analysis: The SurveyMonkey platform is a cloud-based online survey development company, which includes: data analysis, sample selection, bias elimination, and data representation tools. After data collection, user data was transferred directly to the statistical program Statistical Package of Social Science (SPSS) version 22.0 for Windows⁽¹²⁾, after the exclusion criteria were applied using the function that permits the application of filtering rules to online forms that meet the eligibility criteria.

The following measures were implemented for descriptive data analysis. For qualitative variables, absolute and relative frequencies were obtained. For quantitative variables, measures of central tendency (mean and median) and dispersion (standard deviation - SD) were calculated. Fischer's exact test was used for the association tests (independence). All results with a descriptive level lower than 5% (p value <0.05) were considered significant.

RESULTS

The sample for the present study was made up of 30 people, who accepted the terms of consent and responded to the virtual questionnaire, who where 25 (83.00%) were female and five (7.00%) were male. The mean age was 36.73 years (SD=14.24), classified by age range as follows: 14 participants (46.70%) between 18 and 30 years old, eight (26.70%) between 31 and 50 years old and eight (26.70%) over 50 years old. The accesses originated from the following Brazilian regions: 83.43% from the Southeast region, 10.00% from the South region, and 3.33% each from the Northeast and Central-West regions.

The distribution according declared by the study participants was categorized as shown in Table 1.

Table 1 - Distribution of the public responding to the D+Informação usability evaluation questionnaire (n=30). Brazil, 2021.

Distribution of the public	%
Health Professionals	50.0% (15)
PwD	33.3% (10)
Relatives	10.0% (3)
Education professionals	6.7% (2)
Total	100%

Source: Author, 2021.

Regarding the profession exercised by PwD, was declared retirement due to disability (1), technical advisor (1), commerce (1), student (1), photographer (1), environmental manager (1), journalist (1), teacher (1) and psychologist (2). As for the family category, was declared retired bank clerk (1), unemployed (1) and beautician (1). Regarding education professionals, was declared a pedagogue/psychopedagogy person and a teacher. To those who declared health professionals, project assistant (1), dentist (1), nursing (6), student (3), pharmacist (1), physical therapist (1) and psychologist (2).

Additionally, regarding the distribution of the responding public, two participants reported having completed or incomplete high school, 16 had completed or incomplete higher education and 12 had postgraduate degrees. It is noteworthy that 28 of the participants declared undergraduate and postgraduate degrees.

Regarding the reason for accessing the D+Informação Portal, the options were “search for information”, “curiosity” and “share experiences”, and the participant could tick more than one option (Table 2).

Table 2 - Distribution of the reasons for searching D+Informação given by respondents to the D+Informação usability evaluation questionnaire (n=30). Brazil, 2021.

Reasons	Frequency
Search for Information	83.3% (25)
Curiosity	33.3% (10)
Share Experiences	26.6% (8)
Total	100.0 %

Source: Author, 2021.

Of the options marked on the reason for the search, the participants were categorized according to age group and the reason for accessing the Portal (Table 3).

Table 3 - Distribution of reason to search D+Informação, by age group (n=30). Brazil, 2021.

Reason to search	Age	Frequency
Search for information	Up to 30 years old	92.9% (13)
	31-50 years old	50.0% (4)
	Over 50 years old	100.0% (8)
Share experiences	Up to 30 years old	21.4% (3)
	31-50 years old	37.5% (3)
	Over 50 years old	25.0% (2)
Curiosity	Up to 30 years old	50.0% (7)
	31-50 years old	25.0% (2)
	Over 50 years old	12.5% (1)

Source: Author, 2021.

Regarding the reason for accessing the D+Informação Portal and the relationship between the variables: gender, age group, education level, and user; it was noticed that there was no statistical significance

according to the Fisher's Exact Test, between the variables analyzed and the reason for accessing the Portal, with gender $p=0.565$, age group $p=0.218$, education $p=0.741$ and type of user $p=0.748$.

When analyzing the devices used to access the Portal, it can be observed that more than one device per person was used for Portal access: 63.30% of the participants accessed via cell phone, 36.60% via laptop, 30.00% via desktop, and 3.30% via tablet.

It was pointed out by 29 (96.70%) of the respondents, ease of navigating the D+Informação, only one person found navigation difficulty.

With regard to the Portal's interface, there were questions on the language used and visual appearance, and a general rating was given, as shown in Table 4.

Table 4 – Distribution of the participant's opinion as regards the D+Informação interface (n=30), Brazil, 2021.

Participant's opinion as regards the D+Informação interface	Classification	Frequency
Visual appearance of D+Informação Portal	Very bad	--
	Bad	--
	Neutral	--
	Good	26.6% (8)
	Excellent	73.3% (22)
Language of D+ Informação Portal	Very bad	--
	Bad	3.3% (1)
	Neutral	--
	Good	16.6% (5)
	Excellent	80.0% (24)
General rating of D+ Informação Portal	Very bad	--
	Bad	--
	Neutral	--
	Good	26.6% (8)
	Excellent	73.3% (22)

Source: Author, 2021.

The time of use of the D+Informação Portal was divided into categories: less than one month, one month, two months, three months, four months, five months and more than six months (Table 5).

Table 5 – Distribution of time using the D+Informação Portal by its users (n=30), Brazil, 2021.

Time using the D+Informação Portal	Frequency
Less than a month	20.0% (6)
One month	6.7% (2)
Two months	13.3% (4)

Time using the D+Informação Portal	Frequency
Three months	10.0% (3)
Four months	10.0% (3)
Five months	3.3% (1)
More than six months	36.7% (11)
Total	100.0%

Source: Author, 2021

When analyzing the answers to the question of whether D+Informação taught the respondent something new, 23 (76.60%) answered positively, and 7 (23.4%) answered in a negative way.

When asked if was would recommend the D+Informação Portal to someone else, 100.00% of the

participants answered yes.

In order to improve the development of the D+Informação Portal, the participants were asked about any other topic was would like to read on the Portal, of the 30 participants, 10 (33.33%) indicated topic suggestions (Table 6).

Table 6 - Distribution of topics suggested by participants for future publications in D+Informação. (n=10), Brazil, 2021.

Suggestions	Frequency
Power for PwD	1
Pounds	1
Oncology	2
Invite speakers to address health information	1
PwD childhood comorbidities	1
Inclusive education and public policies for PwD	2
Mental health and social inclusion for PwD	1
Pregnancy in PwD	1
Total	10

Source: Author, 2021

DISCUSSION

The sample of this study included a significant percentage of female respondents (83.00%). The majority female group and the age range found in this study (up to 30 years old) with a mean age of 36.73 years (SD=14.24), when classified by age group, we have 14 (46.70%) between 18 and 30 years of age, eight (26.70%) between 31 and 50 years and eight (26.70%) over 50 years were also observed in a

study of dissemination of social networks for information and services of the *Sistema Único de Saúde* (Brazilian Public Health System)⁽¹³⁾.

According to a survey by the Regional Center for Studies on the Development of the Information Society (CETIC) 2021, 82% of Brazilian households interviewed have access to the internet, demonstrating an increase in the latest surveys, and females have accessed the internet more than the

male group⁽²⁾. A study conducted to assess female sexual dysfunctions through a virtual questionnaire made available on social media had a similar age range to that of the present study⁽³⁾. Regarding age, the *Pesquisa Nacional por Amostra de Domicílios* (PNAD) indicates that the age group most connected to social networks is 20 to 24 years, with an increase in the number of accesses among females over 60 years of age⁽¹⁴⁾. Regarding age, the survey (PNAD) cites an increase in access in all age groups, corresponding to the findings of the present study. As well as the profile of people found in previous studies by the Neurorehab research group⁽¹⁰⁻¹¹⁾.

Regarding the profile of the respondents, it was observed that 50.00% belong to the class of healthcare professionals. This category, as another study pointed out, are people who use the internet to acquire new knowledge regarding their professional work⁽⁴⁾. A study conducted to evaluate the perception of healthcare professionals about the influence of the internet in their daily professional lives pointed out that all classes of healthcare professionals describe the use of the internet for the acquisition of new knowledge and to clarify doubts. The participants were predominantly female, and the two classes of healthcare participants with the highest number of respondents were nursing (23.00%) and dentistry (23.00%)⁽⁴⁾. These findings were observed when participants were asked why was accessed D+Informação, with 83.30% of the answers being "Search for information".

Most of the accesses to the D+Informação Portal originated from the Southeast region of Brazil. According to the ongoing PNAD of 2019, internet access increased for households in all regions of Brazil, especially the North and Northeast regions⁽¹⁴⁾. However, these are still the regions with the lowest access when compared to the other Brazilian regions, with the Southeast region leading with the highest access. Access is also related to the per capita income of the region, being different in the Northeastern regions⁽¹⁴⁾. All Brazilian regions were selected for boosting the reach of sponsored posts on Instagram® and Facebook® networks. However, during the promotion of new posts on the Portal, the Neurorehab researchers reposted D+Informação news on their social networks and invited their friends and followers to access the Portal, where the greatest concentration of researchers from the research group is in the Southeast region of Brazil, confirming that the public with which this contact took place was more concentrated in this region. This may have led to a greater amount of people being reached in the research region, the Southeast region, due to the location of their devices. The most used devices to access the Portal were cell phones and computers. This corresponds to the statistics of the *Instituto Brasileiro de Geografia e Estatística* (IBGE - Brazilian Institute of Geography

and Statistics), regarding the most used devices to access the internet, with 98.10% of internet users using cell phones and 50.70% using computers⁽¹⁴⁾.

Considerable diversity was observed among the occupations performed by the PwD demographic who answered the D+Informação usability questionnaire. Brazil has a high level of inclusion of workers with some kind of disability in the labor market when compared to some other countries, especially after the implementation of the *Lei das Cotas* (Quotas Law). However, PwD still face several barriers to inclusion in the labor market, such as prejudice, lack of accessibility and appreciation of the professional⁽¹⁵⁾. There is also the difficulty of reintroduction into the labor market, e.g., for people with spinal cord injuries, due to the delay in access to health services and the beginning of rehabilitation, affecting the work opportunities and social insertion of these PwD⁽¹⁶⁾.

The main reason for searching D+Informação was to search for information. Previous studies point to the internet as the most chosen health information search mechanism, due to the ease of access and variety of references available for reading⁽⁷⁾. In general, searching for information on the internet has been the first choice worldwide due to the ease of access to information on various topics, with the availability of multiple literature references. A North American study also showed that people with higher levels of education are more likely to use the internet as their first choice for searching for health information. This was consistent with the present study which found that the undergraduate and postgraduate education level corresponded to 28 of the 30 study participants⁽¹⁷⁾.

Based on these data, the group's motivation for development grew, which already showed that users of previously developed tools (virtual forum and a social network for PwD), pointed to this demand: search for information with credibility⁽¹⁰⁻¹¹⁾.

Furthermore, during the course of this study, a worldwide factor influenced the continuous search for evidence-based information, the coronavirus (COVID-19) pandemic, with many online publications containing fake news. The research group continuously targeted recent and evidence-based news, posting it on our social networks as a way of providing health education and combating misinformation⁽¹⁸⁾. The evaluation of D+Informação by the research participants showed that, in general, the Portal was evaluated as excellent (73.30% of the answers), with suitable language (80.00%) and visual appearance (73.30%). Likewise, 96.70% declared that it was easy to navigate on D+Informação. A study on accessibility analysis, certification and accesses of a virtual forum, showed that a virtual environment based on scientific evidence becomes a strong source of access to health information and exchange of experiences⁽⁹⁾.

Study limits

As limitations of the study, it was observed that the small size of the sample prevented the use of some specific tests of statistical association. Nevertheless, based on these data, it is believed that the Portal can be considered a virtual environment with a usability suitable for its target audience, according to the perspective of its own users.

CONCLUSION AND IMPLICATIONS FOR PRACTICE:

This study corroborated the need to include the assessment of people with disabilities, family members and professionals in the development of assistive technologies that seek inclusion, aiming at the adequacy of these tools to this specific vulnerable target audience. The evaluation of the usability of the D+Informação Portal was positive in relation to the requirements of ease of navigation, providing new information, friendly interface (language used, visual and general evaluation). The reasons for searching for the portal remained as in previous studies by the research group: search for information, sharing experiences and curiosity, which motivated the development of the D+Informação Portal (<https://demaisinformacao.com.br/>)

Additionally, the indication of new topics to be addressed on the portal by the participants of this study will allow the continuity of the development of the Portal with publications based on scientific evidence relevant to the target audience. Future studies are necessary for the development of new assistive technologies for the information of PwD in the virtual environment, always considering the evaluation and active participation of these people in this process.

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