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Analysis of the Websites of the Leading Health Centers in Spain

Análisis de los sitios web de los centros de salud más importantes de España

Análise dos sites dos centros de saúde mais importantes de Espanha

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This research analyzes the websites of Spanish healthcare groups that lead the primary rankings of the healthcare sector in Spain. A qualitative content analysis methodology was applied using eight variables and 77 evaluation items. The results indicate that the hospitals in top positions in medical directories do not necessarily have the best websites. Additionally, there is minimal adoption of new content trends such as augmented reality, immersive photography, gamification, and podcasts.
Keywords: Health centers, healthcare sector, website, qualitative content analysis, Spain.

Esta investigación analiza los sitios web de los grupos sanitarios españoles que lideran los principales rankings del sector en España. Para ello se aplica una metodología de análisis cualitativo de contenido a partir de ocho variables y 77 ítems de evaluación. Como resultado, se observa que los hospitales que ocupan las mejores posiciones en los directorios médicos no coinciden con los que poseen los mejores sitios web. Además, se detecta una apuesta mínima por las nuevas tendencias de contenidos como realidad aumentada, fotografía inmersiva, gamificación y podcast.
Palabras clave: Centros de salud, sector sanitario, página web, análisis cualitativo de contenido, España.

Esta investigação analisa os websites dos grupos de saúde espanhóis que lideram os principais rankings do setor da saúde em Espanha. Para isso, aplica-se uma metodologia qualitativa de análise de conteúdo baseada em oito variáveis e 77 itens de avaliação. Como resultado, observa-se que os hospitais que ocupam as melhores posições nos diretórios médicos não coincidem com aqueles que possuem os melhores sites. Além disso, detecta-se um compromisso mínimo com novas tendências de conteúdo como realidade aumentada, fotografia imersiva, gamificação e podcasts.
Palavras chave: Centros de saúde, setor saúde, website, análise qualitativa de conteúdo, Espanha.

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Introduction

The penetration of the Internet in developed countries has continuously grown since 2005. According to the International Telecommunication Union (Unión Internacional de Telecomunicaciones, 2023), in 2021, 90 % of individuals living in developed countries used the Internet. This trend is reflected in numerous publications.

The Digital 2021 Global Overview Report, published by We Are Social (2022), indicates that the number of Internet users worldwide reached 4.66 billion people in that year, representing 59.5 % of the global population (7.83 billion). This document highlights the disparity in Internet penetration across different regions. The two regions with the highest penetration in 2021 were Northern Europe (96 %) and Eastern Europe (93 %), followed by North America (90 %). Conversely, the regions with the lowest penetration were Central Africa (22 %) and East Africa (24 %).

In Spain, the number of households with Internet access reached 96 % of the total in 2021 (Instituto Nacional de Estadística, 2022). This figure marks a notable increase from 2019 when only 91 % of households had Internet access. The significant jump occurred in 2020 when the figure reached 95 %.

The data indicates that the consumption of information through digital environments increased following the Covid-19 health crisis. In the field of healthcare, Internet use significantly increased, becoming the primary source of information for patients and their families.

This trend is particularly significant among young people, with 79.9 % stating that they are better informed about their health and well-being thanks to the use of apps and digital tools; 77 % assert that these tools help them adhere to certain habits and routines (Zaragozá Marquina et al., 2023).

Regarding health-related information, especially post-Covid-19 pandemic, several authors have emphasized the need to ensure the reliability of content transmitted via the Internet and social media. March Cerdà (2020) underscores the necessity of "cross-checking and consulting official, primary sources, and sources based on scientific evidence available at the time [as] it is crucial to avoid falling for hoaxes or fake news" (p. 3).

The use of the Internet as a resource for health information was already a predominant activity in line with the new consumption demands of prosumer users long before the pandemic, according to Atkinson et al. (2009) and Van de Belt et al. (2013). For instance, studies in the United States have found that 56% to 80% of Internet users have sought health information online, including details about doctors and hospitals. Among them are studies by Ybarra and Suman (2006) and Jones and Fox (2009).

Marín Torres et al. (2013) argue that this situation has advantages, such as patients making more informed health decisions, increasing their autonomy, and enhancing their adherence to treatments, among other benefits. However, they also identify some issues, primarily related to the poor quality of content on many websites, which connects to the proliferation of hoaxes observed post-Covid-19, leading to anxiety or increased expectations regarding new treatments or alternative therapies.

In connection with this, but from the perspective of social media, Rando Cueto et al. (2021) have studied how the Internet has become a barometer for patient demands. These authors highlight hospitals as healthcare institutions that should provide reliable information.

From the private sector, the medical market has implemented commercial strategies that have successfully established a positive image in the social imagination. The construction of public relations between the hospital enterprise and its environment is crucial, as it projects the organizational culture, institutional leadership, visual identity, patient care and service, as well as patronage activities, collectively facilitating transparency, accessibility, and democratization of medical services online. In the context of technological advancements, interest in health-related websites is on the rise, particularly in the new normal, where many users, for the first time, scheduled their appointments online and used telemedicine.

The free market competition in the medical services sector has necessitated innovation in how these services communicate with a more global than local audience, positioning Web 2.0 tools in service of health. For instance, having a company website is now considered a standard. According to data from the National Observatory of Technology and

Society (2021), the level of Internet penetration in Spanish SMEs and large companies has been stable at 98% from 2016 to 2020. What has slightly increased is the proportion of these companies with a website, rising from 77.5% in 2016 to 78.1% in 2020. A well-managed website, regularly updated with content and interacting with visitors, is one of the most important tools for designing a company's image.

Websites are one of the most important tools for communication and information distribution for hospitals. Therefore, the evaluation of a specific portal's quality should consider various aspects, including design, content, and accessibility, which can determine the healthcare center's effectiveness in utilizing new technologies. Thus, this research aims to analyze the quality of hospital websites through their online qualitative evaluation.

Theoretical framework

The Internet has become an important medium for communication for users interested in specialized health and online medical care topics, a trend that has been growing since the early days of the web, as analyzed by Eysenbach (2000). This has sparked interest within the scientific community to evaluate the quality of websites directly linked to hospital and clinical services, in order to analyze the management of their information as well as the presentation of their personal brand on the web (Medina-Aguerrebere, 2016; Schmidt & Ernst, 2004).

The Internet provides a crucial scientific platform for the exchange of health information, in a massive, open, and easily accessible manner. The benefits of the Internet and new technologies have led hospitals to use virtual environments to better offer their services, resulting in significant efforts and investments to create and improve their institutional websites. A portal with appropriate design and high-quality content becomes a valuable resource for its social agents, serving as the primary reference source. Various studies, such as those by Maifredi et al. (2010) and Salarvand et al. (2016a), point in this direction.

In this regard, the impact on public health of using the Internet for health purposes is related to the potential of innovative digital resources employed by the hospital, allowing, for example, a patient to request

a specific service online. Subsequently, Tejedor et al. (2020) identified issues in the websites of public hospitals, highlighting poor quality in appointment booking and the lack of interactivity with the medical team among the main problems.

Some studies, such as those by Rando and de las Heras Pedrosa (2016), indicate that public healthcare centers are far from making proper use of social media. They note that "the virtual space for conversation, interaction, knowledge exchange, experiences, dialogue..., which social media scholars identify as fundamental characteristics of social networks, does not occur in the healthcare communication sector of Andalusian hospitals" (p. 572). Improving the provision of services via the Internet has become a priority for healthcare organizations in the post-Covid scenario. Currently, this process is underway, and in many cases, having an adequate and robust portal remains a challenge for hospital institutions (Ruiz-Granja, 2015; Zhong et al., 2021).

Recent advancements in technologies and interfaces have significantly transformed the way patients interact with healthcare institutions. There is now a demand for bespoke hospitals offering personalized services, utilizing artificial intelligence resources, and promoting genuinely user-centered experiences. In this context, the new generation of Internet devices and services are true allies in facilitating participation and the exchange of information online (Alhuwail et al., 2018; Gallant et al., 2010).

Hospital websites are considered professional networks for institutional communication, accessed to obtain clear, precise, and comprehensive information, essential characteristics for a society whose 24/7 consumption demands must be met instantly, as agreed upon by the works of Honeycutt et al. (2021) and Alhadreti (2021).

These sites also require features such as up-to-date information, easy access to their content, data privacy, secure navigation, a sitemap to guide searches, a detailed menu with available resources, and a user-centered design. In recent years, it has been proven that the websites that attract users are those that offer appropriate services at the right time and have attractive and user-friendly content. For instance, if users cannot effectively access the information they seek, they will give up and visit other pages (Amiri et al., 2016; Gutiérrez Ponce et al., 2018).

The results of the study by Singh et al. (2014) show that features such as ease of use, aesthetics, and content received acceptable satisfaction scores from users of hospital websites. Salarvand et al. (2016b) determined that hospital websites need to be useful, efficient, credible, secure, and accessible to increase customer satisfaction. Hagerty (2012) evaluated the quality of hospital websites in Norway dedicated to cancer treatment, finding that while these sites offer useful information for cancer patients and their families, they are not particularly attractive portals. In Spain, Gutiérrez-Ponce et al. (2019) evaluated the websites of private hospitals in Andalusia and Catalonia, focusing on good corporate governance. They concluded that these centers face "the challenge of improving the quality of their websites" and "being more transparent in information related to Good Corporate Governance indicators" (p. 13).

Methodology

This work is qualitative in nature and involves the evaluation of websites, focusing on hospitals that occupy the top positions in the main industry rankings. Based on the bibliographic review by Codina and Marcos (2005), Tejedor (2010), and Cobos Urbina and Recoder Sellarés (2019), 13 healthcare groups were selected according to the Private Healthcare Contributing Value Report (Fundación IDIS, 2020) from the Institute for the Development and Integration of Healthcare and the National Hospital Catalogue prepared by the Ministry of Health (Ministerio de Sanidad, 2019). From these references, the Spanish hospital groups with the largest market share and notable business volume were chosen, specifically those whose revenue represents more than 1 % of the sector's total. Their corporate URLs were studied, and in cases where the reference hospital of the group had a different or separate section, that URL was analyzed. All of this is summarized in Table 1.

The monitoring work was carried out during May and June 2021 by the research team, authors of this study. Given that the variables referred to specific hospitals, the websites of their reference centers were chosen and subjected to qualitative content analysis based on eight study variables:

TABLE 1
MAIN SPANISH HOSPITAL GROUPS BY MARKET SHARE AND ANALYZED URL IN EACH CASE

Group	Corporate URL	Reference Center URL (if different)
Quirón	https://www.quironsalud.es/	https://www.quironsalud.es/hospital-barcelona
Orden San Juan de Dios	https://www.sjd.es/centros/	https://www.sjdhospitalbarcelona.org/es
Vithas	https://www.vithas.es/	
HM Hospitales	https://www.hmhospitales.com/	
HLA	https://www.grupohla.com/es/	https://www.grupohla.com/es/hospitales-clinicas/hospital-moncloa
Hermanas Hospitalarias	https://www.hospitalarias.es/	https://www.hospitalbenitomenni.org/
Hestia Alliance	http://hestiaalliance.org/	
Viamed	https://www.viamedsalud.com/	
Hospitales Católicos de Madrid	https://www.hospitalescatolicos.es/	https://www.hospitalbeata.org/
Hospiten	https://hospiten.com/	
Grupo Hospitalario Recoletas	https://www.gruporecoletas.com/	
Pascual	https://www.josemanuelpascualpascual.es/	
Clínica Universitaria de Navarra	www.cun.es	

Source: The authors.

1. Usability: Ease of intuitive handling and smooth navigation through the page.
2. Interactivity: Virtual exchange between the website and its users.
3. Information presented: Presence or absence of relevant information for the user (about the hospital and the website).
4. Updating: Frequent publication of content.
5. Quality references: Possession of a recognized quality seal for health websites.
6. Accessibility: Ability to effectively respond to users with special needs.
7. Tourism: References to tourism as a business vector and international projection.
8. Sustainability and environment: Social responsibility, environmental quality, compliance with the Sustainable Development Goals.

These eight categories of qualitative analysis involved the use of a questionnaire with 77 items summarized in Table 2.

Results

The results are presented based on the eight categories analyzed in the websites of the selected Spanish healthcare groups.

Usability criteria

Most of the websites of the analyzed healthcare groups show acceptable results regarding usability, although some stand out for their excellence while others neglect this aspect, as shown in Table 3. Quirón stands out particularly, as do San Juan de Dios and Clínica Universitaria de Navarra.

Among the analyzed variables, 76.9% of the sites have their own search tool. Additionally, some of them limit the search capabilities for services. On the other hand, all maintain a navigation menu, facilitating user tracking of navigation paths.

Another positive factor is that all sites allow internal navigation through links between various portal contents. However, when analyzing the possibility of consulting the website in different

TABLE 2
EVALUATED ITEMS

Usability	Interactivity	Information presented	Updating	Quality references	Accessibility	Tourism	Sustainability
Website download time under five seconds with ADSL	Email available for inquiries or general information requests	Information on hospital access Internal hospital map Hospital presentation	Date of update	Website adheres to a specific quality accreditation seal for the health sector (Hon Code, WMA, ACSA)	Number of accessibility issues or errors found at the three priority levels WAI-A, WAI-AA, and WAI-AAA was calculated	Specific appeal to health tourism or international patients	Specific appeal to sustainability
Maintains the main navigation menu open on all pages	Provides contact information such as phone, postal address, and/or fax	Identification of executive and medical staff	Transmedia and multimodal strategy			Dedicated space for international travel planning	Specific appeal to SDGs (Sustainable Development Goals)

Usability	Interactivity	Information presented	Updating	Quality references	Accessibility	Tourism	Sustainability
Website content search tool available	Email contact for hospital service requests/ queries	Data on healthcare activities categorized by hospital services	Content search tool			Explicit reference to associated travel agencies or collaborating entities in the tourism sector	Adherence to an environmental quality seal (AENOR, Eco-Label, SIGRE)
Indicates file size, format, and/or download time	Provides contact information such as phone, postal address, and/or fax for hospital service information	Results data Patient guide	Contents can be promoted on social media			Interpreter, accompaniment, and legal management services available	
External links present Internal links provided	Suggestion box available	Epidemiological information and Covid-19 section	Active presence on social media			Languages supported	

Usability	Interactivity	Information presented	Updating	Quality references	Accessibility	Tourism	Sustainability
Language configuration available	Option to schedule medical appointments via the website	General service portfolio and by specialties	360º videos or photographs, gamified content, and augmented reality				
Site map available		Information on waiting lists	Option for comments, forums, or chat				

Source: The authors.

TABLE 3
ANALYSIS ACCORDING TO WEBSITE USABILITY CRITERIA

Center	Score (out of 9)
Quirón	9
Orden San Juan de Dios	7
Clínica Universitaria de Navarra	
HM Hospitales	6
Vithas	5
Hermanas Hospitalarias	
HLA	4
Hestia Alliance	
Viamed	
Hospitales Católicos de Madrid	
Hospiten	
Grupo Hospitalario Recoletas	
Pascual	3

Source: The authors.

languages, only 61.5 % of the sites offer this option. Most of these sites offer languages native to Spain, though some also include English and, to a lesser extent, other languages such as French, German, Arabic, and Russian. The overall evaluation is lower when analyzing aspects such as the existence of external links to other websites, with only 38.4 % of the sites containing them. Even fewer sites include a sitemap (23 %) or have links that describe the URL or the name of the linked site (23 %). Lastly, only one portal (7.69 %) provides information on the size, format, and/or download time of files.

Interactivity and User Relationship

According to Coma (2011), interactive materials engage visitors in the construction of their own knowledge, transforming them into active agents and fostering loyalty among potential clients. These materials provide the maximum number of communication channels and information selection options, helping to establish a bidirectional relationship between the health center and the user. Hernández (2011)

argues that web interactivity should be established as a space for dialogue, a privileged digital meeting and feedback arena. With new technologies, an interactive model can be proposed where there is no division between senders and receivers, as all are active participants in the communicative act 2.0 (Aparici, 2010).

Almost all the healthcare groups studied contain references and tools to ensure user relationships, as detailed in Table 4. In all cases, forms, as well as telephone numbers and postal addresses, are provided. However, not all of them allow for scheduling and booking medical appointments through their website, something only possible in 84.6% of the cases studied. Fewer portals include reference information and contact details for specific hospital and/or medical center services. Even fewer openly provide email addresses for inquiries about the group or hospital services (61.5%) or for general inquiries (46.1%). Very few, 38.4%, explicitly offer a suggestion box on the web. It is considered that this type of information is protected to prevent cyber-attacks

TABLE 4
ANALYSIS ACCORDING TO INTERACTIVITY AND USER RELATIONSHIP CRITERIA

Center	Score (out of 9)
Hermanas Hospitalarias	6
Clínica Universitaria de Navarra	6
Orden San Juan de Dios	5
Vithas	5
HM Hospitales	5
Hospiten	5
Quirón	4
Viamed	4
HLA	4
Hospitales Católicos de Madrid	3
Pascual	3
Grupo Hospitalario Recoletas	2
Hestia Alliance	1

Source: The authors.

against the medical center systems, as cybercriminals may exploit this data for extortion when publicly exposed.

Analysis of presented information

The information that each healthcare group includes on their portals varies significantly. Of the 26 characteristics studied, some groups meet more than 20 (Clínica Universitaria de Navarra, San Juan de Dios, HM, or Grupo Quirón), while others do not reach ten (Hestia and Hospiten), as shown in Table 5. All the analyzed websites include service portfolios, both general and for specific services. They also have a news section and a specific section for press or communication. When analyzing the presence of hospital access information, some type of map, or internal directions of the health center, 84.6% of the pages contain this information. In 61.5% of the cases, there is information on how to reach and locate the facility. A significant majority (76.9%) of the centers or groups include some type of presentation in various

TABLE 5
ANALYSIS ACCORDING TO THE INFORMATION PRESENTED ON THE WEBSITE

Center	Score (out of 26)
Clínica Universitaria de Navarra	25
Orden San Juan de Dios	24
HM Hospitales	23
Quirón	20
Vithas	17
Hermanas Hospitalarias	17
Hospitales Católicos de Madrid	14
Pascual	12
HLA	12
Grupo Hospitalario Recoletas	10
Viamed	10
Hospiten	7
Hestia Alliance	5

Source: The authors.

formats, such as a letter from their leaders or references to the group's mission and vision. Very few groups (15.3%) provide information about the organizational structure explicitly mentioning positions and individuals. However, they do identify medical and nursing staff with positions and names in most services (69.2%). Fewer groups and centers provide data on service-specific healthcare activity (53.8%), within the hospital's annual report (46.1%), or in a general manner (38.4%). Regarding epidemiological information, 53.8% of the groups or centers include general references, and 46.1% have a specific section on Covid-19.

Most of the websites have a section or page with general health advice (61.5%), as well as information on specific diseases (61.5%). Very few, however, include information on preparing for diagnostic tests (23%), hospital activities (46.1%), visiting hours (46.1%), patient rights and responsibilities (46.1%), or cafeterias (23%). Although it is common to find some type of patient guide (53.8%), 61.5% offer information on the user service department, but in few cases (38.4%) is the procedure for filing a complaint or suggestion clearly identified. Additionally, a specific section on research is not commonly found, with only 46.1% of the analyzed sites including one.

Typology and Content Updating

None of the hospital group websites indicate the last update, although in some cases, the year of the portal's renewal is mentioned. As shown in Table 6, most of the studied hospitals receive low ratings regarding

TABLE 6
ANALYSIS ACCORDING TO THE TYPOLOGY AND UPDATING OF CONTENTS

Center	Score (out of 20)
Orden San Juan de Dios	17
Clínica Universitaria de Navarra	15
HM Hospitales	13
Quirón	13
Hospitales Católicos de Madrid	13

Center	Score (out of 20)
Vithas	11
Hospiten	11
Grupo Hospitalario Recoletas	10
Viamed	9
Hermanas Hospitalarias	8
Pascual	8
HLA	6
Hestia Alliance	6

Source: The authors.

the typology and updating of contents.

Frequency of updates and content typology

Regarding the frequency of updates, it is very low in several portals. Only one case was found where no new publication was identified in the last month (Hestia), while in other cases, differences of up to six months between publications were observed (Grupo Pascual). All the analyzed groups and hospitals have a presence on some social network. Only HLA does not inform about its presence on social networks on its website, although its profile was found, at least, on Twitter. Thus, YouTube and Twitter (both 84.6%) are the preferred social networks for the main Spanish healthcare groups, while Facebook (69.2%) and Instagram (46.1%) have a significantly lower presence. Similarly, only 69.2% of the analyzed websites include the option to share some part of the content on social networks.

Regarding the content typology found on the portals of private hospital groups in Spain, all cases include textual and photographic content. However, 61.5% of the analyzed websites have audiovisual content, only one case included sound content in podcast format, and 38.4% had multimedia content. None of the portals displayed 360º videos or photographs or used augmented reality, with only 15.3% presenting some type of content with a gamified perspective. There is a complete absence of chats or forums, and very few portals offer the option to include comments in any section of the website (15.3%), and in this case, only in the news section. Overall, only 23% of the healthcare groups demonstrate any type of transmedia strategy regarding the content on their website and the use of social networks.

Quality references

The quality variable is defined as the totality of characteristics of the health center that determines its ability to satisfy the demand of its target audience, influencing the degree of user satisfaction (Morales Vargas & Codina, 2019). This component is related to the quality of service delivery, provider assistance, excellence as the ultimate goal, adherence to the main codes of ethics, transparency in information, responsible association, absence of conflicts of interest, auditing and accountability, international accreditation programs, certifications, and seals awarded. These parameters constitute a reference of trust for health entities, scientific institutions, research centers, and professional groups (Castillo et al., 2018).

The seals of healthcare quality agencies are created to promote and guarantee the quality and continuous improvement of health services through a set of evaluation items that certify the best practices of hospitals and clinics (Moreno et al., 2019). In this research, and from the qualitative analysis conducted on the websites, only four of the 13 groups studied include in their public information adherence to a specific quality accreditation seal for the health sector. Additionally, the seals reflected on their websites are awarded by associations within the private healthcare sector.

Accessibility criteria

The accessibility component refers to universal access, making it essential that web development is user-centered. In digital health, accessibility is key to preventing the exclusion of vulnerable groups. To evaluate the accessibility of websites, there are questionnaires that perform automatic assessments. The World Wide Web Consortium launched the Web Accessibility Initiative (WAI) in 1997 to develop and promote the use of strategies, guidelines, and resources aimed at making the web accessible to people with disabilities. In 1999, WAI published its first accessibility guidelines titled Web Content Accessibility Guidelines 1.0 (WCAG), with its second version reaching the ISO standard level (WAI, 1999).

The WCAG 2.0 (WAI, 2013) are organized into four levels: principles, guidelines, conformance criteria, and techniques. The

principles state that all content must be perceivable, operable, understandable, and robust. The guidelines provide a framework for understanding the criteria and techniques. The conformance criteria are verifiable statements about web content, each associated with conformance levels A, AA, and AAA. Finally, there are documented techniques applicable to the development or evaluation of accessibility, which can be sufficient techniques, advisory techniques, and common failures.

In the applied study, it was observed that the portals of private health groups in Spain mostly do not show concern for the accessibility component of information; that is, they have neglected accessible design for all types of users. Only two, Quirón and Clínica Universitaria de Navarra, achieve a AA conformance level, while the rest remain at level A.

Health tourism / Internationalization

Less than half of the websites of the analyzed groups consider the potential visit of patients from other countries or different linguistic backgrounds. Of the nine items analyzed, Clínica Universitaria de Navarra is the only group or center that meets all of them, while in seven cases, none are met, as shown in Table 7. Only 46.1% of the portals include some type of section or space for patients from other countries, despite health tourism increasingly becoming an important element in the diversification of the private healthcare business. The same percentage of centers offer travel organization possibilities, while only 38.4% include a space for some reference to tourism, and only 23% mention some type of travel agency.

The international orientation of these websites is clearly evident in the language options they provide. Thus, 38.4% of the pages can be consulted in English, 23% present information in languages of European Union countries such as French or German, and in another 23% of cases, consultations can be accessed in languages such as Russian, Chinese, and Arabic. Only two portals, those of the Order of Saint John of God and the Clínica Universitaria de Navarra, are available in all these languages.

TABLE 7
ANALYSIS ACCORDING TO INTERNATIONALIZATION CRITERIA

Center	Score (out of 9)
Clínica Universitaria de Navarra	9
Orden San Juan de Dios	8
Vithas	8
Viamed	7
HM Hospitales	6
HLA	2
Hospiten	0
Quirón	0
Hospitales Católicos de Madrid	0
Hermanas Hospitalarias	0
Pascual	0
Hestia Alliance	0
Grupo Hospitalario Recoletas	0

Source: The authors.

Sustainability and environment

When evaluating the criteria of sustainability and the environment, the focus is on the healthcare center's commitment to the Sustainable Development Goals; that is, it addresses the hospital's awareness of its role in environmental aspects and its actions that produce favorable environmental impacts, always framed within ethical and transparent behavior (Rodríguez-López et al., 2021).

This parameter analyzes whether the institution operates within the social environment as a sustainable and responsible agent, with a genuine responsibility in the service delivery area, aiming to stand out by not generating negative environmental impacts, thereby enhancing the overall quality of life for the population (Morales et al., 2019). It assesses whether the healthcare center participates in initiatives for environmental improvement, sustainable organizational management, and environmental performance (Rojas-Criollo, 2016).

A summary is provided in Table 8. It can be noted that sustainability is explicitly present in 69.2 % of the analyzed portals, either with a specific

section or prominently within the quality or general information section of the hospital group or center. However, none of the analyzed portals explicitly and prominently reference the Sustainable Development Goals (SDGs), and only 38.4% show possessing some type of environmental quality seal or considering environmental criteria. In this context, all the seals are awarded by AENOR, while no center adheres to specific healthcare-related seals such as the Sigre system.

TABLE 8
ANALYSIS ACCORDING TO SUSTAINABILITY CRITERIA REFLECTED ON THE WEB

Center	Score (out of 3)
Vithas	2
Viamed	2
HLA	2
Hermanas Hospitalarias	2
Hestia Alliance	2
Orden San Juan de Dios	1
Clínica Universitaria de Navarra	1
HM Hospitales	1
Pascual	1
Hospitales Católicos de Madrid	0
Quirón	0
Hospiten	0
Grupo Hospitalario Recoletas	0

Source: The authors.

CONCLUSIONS

At the end of this research, it is undeniable that websites provide a useful method of communication between hospitals, patients, and medical teams. In this sense, a website with a coordinated structure and content significantly impacts efficiency and user satisfaction. The key to improving the management of a given portal is to consider criteria such as design, content quality and credibility, links to other websites, as

well as privacy and confidentiality of personal information. Achieving these objectives requires an integral effort from an interdisciplinary team that includes professionals from various technical-humanistic disciplines such as community managers, physicians, web designers, and digital journalists.

As a general result, a highly variable scenario is reported, with few websites being excellent and others reflecting poor quality and scant information. These results suggest that the web proposals of hospital centers have several limitations. Very few hospitals provide information that could increase the hospital's credibility and user trust. It appears that hospital centers are not, at least for the moment, interested in offering immersive experiences linked to new technologies and artificial intelligence. It is also observed that the websites are considered by their managers more as a source of information than as an interactive bidirectional communication platform between patient and doctor.

Hospitals should not overlook the new resources of digital communication, especially in terms of health promotion. In this regard, there is a need to automate the search engine, online consultations, membership functions, language settings, use of interactive chatbots, health topic podcasts, and 360-degree videos. Online security systems should be implemented simultaneously to improve access and to control and prioritize user privacy.

In their aim to serve their patients, health centers must make significant efforts in web management. Designing a portal is not an amateur or improvised task, as there are technical conditions that must be guaranteed. Therefore, IT and software services will be essential for hospital centers to improve the quality of service in the future (Bulger & Davison, 2018; Manca et al., 2021; Valtonen et al., 2019).

The study provides a diagnostic report on the defining elements of the websites of Spanish private hospitals in terms of content, informational access, visibility, and usability, highlighting their respective strengths and weaknesses. Following the online evaluation, it is considered important for healthcare professionals to recognize the significance of communication in a highly digitalized society. Therefore, it would be beneficial to promote media literacy spaces within the hospital centers themselves.

Such studies have limitations as they capture a snapshot in time, losing value as time elapses between the analysis and its final publication. Nevertheless, the contributions presented are relevant, as a comprehensive, systematic, and thorough review of all groups has been conducted, in contrast to previous studies that take a partial approach from social networks, governance, or patient information systems. The presented research also highlights the need to enrich the content of hospital websites to make them reliable reference spaces in a context of proliferating dubious health-related communications. It provides a complete overview of hospital websites that should also serve as a basis for their improvement.

Finally, the research emphasizes the need to optimally, effectively, and efficiently manage the presentation of medical services on the Internet, as users will choose healthcare providers based on the image they project in virtual environments. This includes, as analyzed, a series of variables that contribute to a digital reputation of who we are in the health sector.

This work opens up several lines for future research, such as the communication of health tourism or the possibility of measuring the degree of media literacy among healthcare professionals, as well as the perception users have of the websites of major hospital centers, whether public or private.

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Appendix I
Website Evaluation Questionnaire

	Usability	
1	Website download time under five seconds with ADSL	0/1
2	Keeps the main navigation menu open on all pages	0/1
3	Search tool for website content available	0/1
4	File size, format, and/or download time indicated	0/1
5	External links to other websites	0/1
6	Internal links to other sections of the hospital website	0/1

7	Links describe the URL or name of the linked website	0/1
8	Sitemap available	0/1
9	Platform allows selection between different languages	0/1
	Interactivity and User Relationship	
10	Email available for general inquiries or information requests	0/1
11	General information phone number, postal address, and/or fax provided	0/1
12	Email available for requests/inquiries with hospital services	0/1
13	Phone number, postal address, and/or fax provided for information on hospital services	0/1
14	Suggestion box available	0/1
15	Option to schedule medical appointments through the website	0/1
	Presented Information	
16	Information on hospital access (address and/or location map)	0/1
17	Hospital address and/or map (buildings, floors, consultation rooms)	0/1
18	Hospital presentation (letter from the manager, vision, mission)	0/1
19	Identification of executive staff with an organizational chart and names	0/1
20	Identification of medical and nursing staff with position and name	0/1
21	Data on healthcare activity by hospital services	0/1
22	Data on healthcare activity in the hospital's general report	0/1
23	Outcome data	0/1
24	Epidemiological information relevant to the hospital and the population	0/1
25	Section or page dedicated to Covid-19	0/1
26	Hospital service portfolio by specialties	0/1
27	General hospital service portfolio	0/1
28	Information on waiting lists	0/1
29	Section on health advice	0/1
30	Information on preparation for diagnostic tests	0/1
31	Information on diseases or links to pages that provide it	0/1
32	Information for users about hospital activities	0/1

33	Section with hospital news or general interest news	0/1
34	Hospital press or communication section	0/1
35	Section dedicated to research and/or teaching-training	0/1
36	Patient guide	0/1
37	Information on how to reach the hospital (transportation)	0/1
38	Information on visiting hours	0/1
39	Information on user rights and responsibilities	0/1
40	Information on the User Service Department	0/1
41	Information on cafeterias, hours, and location	0/1
42	Information on how to file a complaint or suggestion	0/1
	Content Typology and Updates	
43	Update date available	0/1
44	Information updated within one month of the review date	0/1
45	Keywords highlighted in bold	0/1
46	The hospital is present on social media, with links from the website	0/1
47	The hospital has a Facebook account	0/1
48	The hospital has a Twitter account	0/1
49	The hospital has an Instagram account	0/1
50	The hospital has a YouTube account	0/1
51	Textual content available	0/1
52	Photographic content available	0/1
53	Audiovisual content available	0/1
54	Sound content (podcast) available	0/1
55	Multimedia content available	0/1
56	360º videos or photographs available	0/1
57	Augmented reality content available	0/1
58	Gamified content available	0/1
59	News section available	0/1
60	Forums or chats available	0/1
61	Transmedia strategy in place	0/1
62	Content can be shared on social media	0/1
63	Option for comments available	0/1
	Quality References	
64	Website adhering to a specific quality accreditation seal for the health sector (Hon Code, WMA, ACSA)	0/1

	Accessibility
65	Following the works of Ramos and Clabo (2008), Jiménez et al. (2009), and Calvo-Calvo (2014), the usability analysis was evaluated using the automatic tool Web Accessibility Test (TAW), developed by the Information and Communication Technology Center (http://www.tawdis.net). This tool calculated, for each website, the number of accessibility problems or errors found at the three priority levels: WAI-A, WAI-AA, and WAI-AAA
	Tourism or International Patients
66	Dedicated space for planning international travel
67	Explicit reference to associated travel agencies or collaborating entities in the tourism sector
68	Interpreter services
69	Accompaniment services
70	Legal management services
71	English
72	Other EU languages
73	Other non-EU languages
74	Specific appeal to health tourism or international patients
	Sustainability and Environment
75	Specific appeal to sustainability
76	Specific appeal to the SDGs
77	Adherence to an environmental quality seal (AENOR, Eco-Label, SIGRE)

Source: The authors.

Profiles

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