
Miscellaneous

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Submitted
September 1st, 2023
Approved
January 26th, 2024

© 2024
Communication & Society
ISSN 0214-0039
E ISSN 2386-7876
www.communication-society.com

2024 – Vol. 37(2)
pp. 197-216

How to cite this article:
Medina Aguerrebere, P., Medina, E. & González Pacanowski, T. (2024). Promoting Hospitals' Reputation through Smart Branding Initiatives. A Quantitative Analysis of the Best Hospitals in the United States, *Communication & Society*, 37(2), 197-216.
doi.org/10.15581/003.37.2.197-216

Promoting Hospitals' Reputation through Smart Branding Initiatives. A Quantitative Analysis of the Best Hospitals in the United States

Abstract

Hospitals use different technological tools to implement corporate communication initiatives and, in this way, improve their relationships with stakeholders (employees, patients, media companies) and build a reputed brand. However, they face different barriers: limited budgets for corporate communication, strict legal frameworks, and stakeholders' new needs regarding information and emotional support. This paper aims to analyze how the 100 best hospitals in the United States manage smart technologies to promote their brand. To do that, we conducted a literature review about smart hospitals, branding, and corporate communication; and then we defined 34 quantitative indicators to evaluate how the hospitals previously mentioned managed their websites, online newsrooms, about us sections, and artificial intelligence department web sites for reputation purposes. Our results proved that most hospitals respected indicators related to the homepage (8.67/11) but not those referring to online newsrooms (4.44/11) or about us sections (2.66/6). Besides, only 23 hospitals had implemented a department specialized in artificial intelligence that collaborated with external organizations. We concluded that most American hospitals focused their reputation efforts on patients rather than other targets (media companies, employees, suppliers, shareholders); and that these organizations did not integrate enough artificial intelligence projects into their smart branding initiatives.

Keywords

Hospitals, corporate communication, branding, websites, artificial intelligence.

1. Introduction

Hospitals implement several corporate communication initiatives to enhance their relationships with stakeholders (employees, patients, public authorities, and media companies) and, in this way, build a reputed brand. Most of them resort to traditional communication tools such as corporate events, media relations, brochures, or magazines; however, these tools are insufficient to build a reputed brand. Besides, these organizations face different business

barriers that force them to innovate in their communication practices: limited budgets in this area, strict legal frameworks, stakeholders' new needs regarding information and emotional support, etc. Some hospitals have decided to revamp their corporate communication tools to overcome these barriers efficiently. That is why they now use platforms such as corporate websites, online newsrooms, social media platforms, mobile applications, or artificial intelligence-based tools.

Many papers have been published about corporate communication in hospitals, but no publication has evaluated hospitals' branding processes in online platforms from a practical perspective. This paper aims to analyze how the best hospitals in the United States manage smart technologies (corporate websites, social media platforms, mobile apps, artificial intelligence) improve their relationships with stakeholders and reinforce their brand. More precisely, we try to answer two key questions: a) how many hospitals use homepages, online newsrooms, about us sections, and artificial intelligence department websites to promote their brands? and b) what are the most common tools used in each platform for branding purposes?

To do that, we conducted a literature review about smart hospitals, branding, corporate communication, smart branding initiatives, and smart reputation management. Then, we analyzed how the 100 best hospitals in the United States managed different technological tools instruments to implement smart branding initiatives. To do that, we defined 34 indicators that referred to 4 technological tools and several targets: 1) homepage (patients, society); 2) online newsroom (media companies); 3) about us section (public authorities, suppliers, shareholders); and 4) department of artificial intelligence (employees). Finally, we explained our results, limitations, and research avenues, and we proposed three main conclusions to help hospitals worldwide enhance their smart branding initiatives.

2. From smart hospitals to smart branding

2.1. Smart hospitals

Hospitals manage different technological tools to improve their internal processes and, in this way, enhance patients' medical outcomes: artificial intelligence, big data, telemedicine, and health wearables (Tom *et al.*, 2020). Artificial intelligence combines computer sciences, machine learning, deep learning, and data sets to fix problems in different areas: diagnosis, treatments, and monitoring (Shi *et al.*, 2020). This technology has changed how doctors and nurses interact with patients: these relationships are now intimately connected with different information environments and several digital technologies (Burr, Taddeo & Floridi, 2020). Thanks to artificial intelligence, hospitals can improve their performance in three main areas: a) medical imaging, where computer vision techniques, machine learning platforms and deep neural networks help doctors achieve remarkable results (Kaissis *et al.*, 2020); b) service delivery, which includes online appointments, data recording for diagnosis, and monitoring of patients (Dhagarra, Goswami & Kumar, 2020); and c) surgery, where robots contribute to reduce technical risks and improve patients' medical outcomes (Ramón Fernández, 2021). Nevertheless, the broad application of artificial intelligence in hospitals also faces several barriers: the limited dataset availability for algorithm training and validation (Kaissis *et al.*, 2020), patient privacy and security (Lin & Hou, 2020), and the development of new legal frameworks that ensure quality standards and control over the data (Rubeis, 2022).

Big data refers to how hospitals manage enormous amounts of heterogeneous data to improve their medical services (Tom *et al.*, 2020). This technology provides several benefits and helps doctors strengthen patient relationships (Howe & Elenberg, 2020). Thanks to big data, hospitals can face some challenges more efficiently: rising health costs, aging population, precision medicine, and increased non-communicable diseases (Zerka *et al.*, 2020). Furthermore, hospitals can use big data for disease progress modelling, risk analysis, and outbreak detection (Bhanot *et al.*, 2021). However, using this technology also involves some

problems: for example, some patients have concerns about data collection, unauthorized access, technical errors, and the secondary use of their medical information (Tseng *et al.*, 2020). For this reason, some hospitals collaborate with public authorities to develop data privacy protection policies and ensure that these data are only used to provide decision support (Lv & Qiao, 2020). Big data contributes to making hospitals' medical services more effective and efficient; nevertheless, preserving patients' rights remains a priority for every hospital (Ramón Fernández, 2021).

Telemedicine enables remote access to healthcare services and eases mutual interaction between doctors and patients; besides, it helps them optimize their time and reduces the hospital's waiting lists (Mahmoud *et al.*, 2022). Telemedicine allows doctors and patients to establish new communication relationships based on trust, respect, and data (Bassan, 2020). This technology is beneficial in some areas (teleradiology, psychotherapy, and teleneurology) and for patients living in rural zones or developing countries (Nittari *et al.*, 2020). The positive impact of this technology has led several hospitals and schools of medicine to train their doctors and nurses in this area (Tangari *et al.*, 2021). On the other hand, telemedicine experts have also contributed to developing health wearable devices that collect real-time data about patients' health: behaviors, exercises, or habits (Jiang & Shi, 2021). These wearable devices collect information about medical indicators, such as patients' blood pressure, heart rate, etc. (Luo *et al.*, 2020). Thanks to wearable devices, patients enhance their medical outcomes, and hospitals improve their internal processes (Mina, 2020; Ni, Wang & Qian, 2021).

2.2. Smart branding initiatives

The hospital's brand includes five intangible elements influencing stakeholders' perceptions: identity, values, mission, vision, and culture (Medina Aguerrebere, Pacanowski & Medina, 2020). When hospitals define these elements, they reinforce the organization's brand genuinity, which refers to the degree to which a brand expresses its corporate intention without hiding anything (Hart & Phau, 2022). Building a unique brand constitutes a priority for hospitals interested in reinforcing their strategic positioning in the health industry (Odoom, Narteh & Odoom, 2019). To efficiently do that, these organizations must analyze their stakeholders' communication needs and find synergies between those needs and the hospital's branding priorities (Lithopoulos *et al.*, 2021). This process has become more accessible thanks to artificial intelligence and big data since these technologies allow hospitals to analyze enormous amounts of data cost-effectively (Tsai *et al.*, 2021). Finally, this technology also helps hospitals display brand-related elements more visually and creatively (Butow & Hoque, 2020), influencing their stakeholders' perceptions about the hospital's brand (Shi *et al.*, 2020).

Once the hospital has defined its brand, the next step is to implement communication initiatives to promote its uniqueness (Berg *et al.*, 2021). To do that, these organizations manage different platforms, such as social media, online communities, mobile apps, and patient portals (Medina Aguerrebere, Pacanowski & Medina, 2020). Thanks to social media platforms, these organizations implement creative communication campaigns that reinforce the hospital's brand value (Shieh *et al.*, 2020). To efficiently achieve this goal, many hospitals set up an in-house Social Media Unit that defines and executes an annual content plan whose main objective is to promote the hospital's brand (Medina Aguerrebere, Pacanowski & Medina, 2020). The Social Media Unit helps employees understand how to respect the hospital's brand when interacting with patients on social media platforms (Odoom, Narteh & Odoom, 2019). On the other hand, this Unit defines and implements online communities where patients can share their experiences with the hospital (Confente & Kucharska, 2021), search for emotional and social support (Cheng & Wang, 2021), and reinforce their relationships with doctors and nurses (Berg *et al.*, 2021). Thanks to branding initiatives implemented on social media platforms and online communities, hospitals can build their brand collectively along with their stakeholders and become a more credible organization (Mheidly & Fares, 2020).

Besides social media and online communities, hospitals use mobile apps to implement branding initiatives. According to Dang *et al.* (2021), these applications provide a new opportunity for disease prediction and for patients' health self-management. Moreover, patients with limited health literacy can use these applications to receive follow-ups about their treatments and diseases (Crossley *et al.*, 2020). Finally, mobile apps are also helpful for implementing health education campaigns and changing people's behaviors (Mackert *et al.*, 2020). In other words, thanks to mobile apps, hospitals share meaningful content that positively influences their stakeholders' perceptions (Chamberlain *et al.*, 2021). On the other hand, many hospitals integrate their mobile apps with their patient portals (Parsons, Hron & Bourgeois, 2020). This way, patient portals become potent platforms for clinical care, diagnosis, treatment, and prognosis (Manrique de Lara & Peláez-Ballestas, 2020), reinforcing the hospital's scientific credibility (Lv & Qiao, 2020).

2.3. Smart reputation management

According to Govers (2020), reputation refers to indivisible networks of associations that stakeholders deploy whenever they think about an organization. These networks are highly influenced by the organization's branding initiatives (Xifra, 2020). On the other hand, most of these branding actions occur on the Internet: corporate websites, social media platforms, mobile apps, etc. (Khosravizadeh *et al.*, 2021). For this reason, most hospitals focus their branding initiatives on online platforms (Bol, Smit & Lustria, 2020). Thanks to these platforms, these organizations implement more dynamic and visual communication initiatives and share meaningful content in different formats, such as text, images, videos, or infographics (Triemstra, Poepelman & Arora, 2018). In other words, thanks to social media, mobile apps, and corporate websites, hospitals are becoming a trustworthy source of scientific information and emotional support, reinforcing their reputation (Tangari *et al.*, 2021).

However, managing hospitals' online reputation does not only refer to using technological platforms; these organizations must also promote employees' human values and protect patients' rights (Medina Aguerrebere, Pacanowski & Medina, 2020). Experts in branding hospitals consider patients' and doctors' perceptions from a medical, social, and human perspective (Mheidly & Fares, 2020). For this reason, several hospitals recruit experts in humanities –philosophy, sociology, etc.– to launch branding initiatives (Li & Xu, 2020) that promote values such as knowledge, empathy, compassion, and transparency (Shafiee, Ansari & Mahjob, 2022). According to these experts, doctors and nurses must respect four principles when they use social media, websites, and mobile apps for branding purposes: a) complying with ethical standards and legal frameworks (Nageshwaran, Harris & Guerche-Seblain, 2021); b) respecting stakeholders' rights to know how their data are used and requiring them an informed consent when needed (Schmit *et al.*, 2020); c) helping stakeholders, especially patients, in a honest way without judging them (Véliz, 2019); and d) sharing information allowing stakeholders to understand the hospital's brand in an unbiased way (Reed-Berendt, Dove & Pareek, 2020).

Patients also play a crucial role in hospital's branding initiatives (Lithopoulos *et al.*, 2021). For this reason, these organizations collaborate with public authorities to define legal frameworks that protect patients' rights: processing data, erasing information, etc. (Galvin & De Muro, 2020). Respecting patients' privacy is essential to promote the hospital's reputation (Ramón Fernández, 2021). For this reason, some hospitals have developed codes of conduct that help doctors and nurses protect patients' privacy when using online platforms (Molnár-Gábor & Korbel, 2020). Hospitals also resort to these codes to update their online corporate communication initiatives and their branding strategies (Fazal *et al.*, 2022). Finally, hospitals also implement training sessions for patients to help them understand how to use online platforms when they interact with doctors (Belani *et al.*, 2021). Thanks to codes of conduct and training sessions, hospitals enhance their branding initiatives (Bassan, 2020).

2.4. Branding and reputation initiatives in American hospitals

American hospitals resort to corporate communication to reinforce their relationships with stakeholders, especially with employees: thanks to communication, hospitals improve decision-making processes and build a robust organizational climate (Barrett, Ford, & Zhu, 2023). These organizations also implement communication initiatives addressed to patients since it improves their satisfaction with medical services and reinforces their empowerment (Agarwal, Pelullo & Merchant, 2019). On the other hand, some American hospitals implement workshops, training sessions, and other initiatives addressed to patients' associations and community groups (Franz *et al.*, 2018). Finally, these hospitals also launch corporate communication initiatives to strengthen their relationships with public authorities (Kim & Kreps, 2020) as well as media companies, especially when they implement campaigns to fight misinformation and protect citizens' right to quality healthcare information (Olson, Berry & Kumar, 2020). American hospitals reinforce their social legitimacy and scientific credibility thanks to these activities with employees, patients, public authorities, and media companies (Li *et al.*, 2021).

Besides corporate communication, some American hospitals use marketing to promote their brands. Hospital marketing initiatives reinforce these organizations' brands and help patients become proactive players who understand conditions and choose healthy behaviors (Parkinson & Davey, 2023). According to Schwartz and Woloshin (2019), investments in this area in the United States have increased in the last twenty years: marketing spending in these organizations has increased from \$542 million in 1997 to \$2.9 billion in 2016, representing a 430% increase. Even if most hospitals in the United States decide their investments in marketing based on their financial performance (Harrison *et al.*, 2022), most of them always invest in this area since it allows them to build the brand collectively and improve patients-doctors relationships (Hathaway *et al.*, 2023). Finally, most American hospitals train their employees on cultural aspects to efficiently represent the brand (Nandyal *et al.*, 2021), which is essential to make the organization's marketing efforts more efficient (McFarland, Shen & Holcombe 2017).

In the coming years, hospitals must create a culture for digital transformation and invest in technology that communicates, improves patient experiences, and facilitates internal processes (Martin *et al.*, 2018). In the United States, after COVID-19, U.S. patients have increased their utilization of smart applications, such as social media platforms, to identify services and collect information (Mason *et al.*, 2021). For this reason, hospitals have reinforced their investments in this area. Thanks to social media platforms, hospitals increase the coordination among health professionals, which helps them socialize and interact with different stakeholders (Naeem & Ozuem, 2021). Besides, according to different surveys conducted in the United States, there is a positive association between a hospital's social media engagement and its patients' perceptions about these organizations' medical quality (Lee, In & Lee, 2020). Finally, using social media positively influences hospitals' reputation and their positions in global rankings (Triemstra, Poepelman, Arora, 2018). In other words, using these platforms constitutes an opportunity to improve hospitals from an organizational, medical, and branding perspective (Esmaeilzadeh, 2020).

3. Methodology

Artificial intelligence, big data, telemedicine, health wearables, social media, and mobile apps have made hospitals' medical services more efficient. Moreover, this technology has also helped these organizations revitalize their corporate communication initiatives and reinforce their scientific credibility. To better understand how hospitals manage these technological platforms for branding and reputation, we resorted to the World's Best Hospitals 2023, an annual ranking published by *Newsweek* and *Statista*. Both companies analyzed 2.300 hospitals from 28 countries and supplied rankings by medical specialty and by country, as well as a

global ranking. *Newsweek's* and *Statista's* researchers considered four criteria when elaborating each ranking: a) online survey to 80.000 medical experts from 28 countries; b) patients' experience survey in each hospital considered; c) hospitals' quality metrics; and d) PROM questionnaires where patients evaluated their functional well-being and quality of life. When calculating each hospital's score, *Newsweek's* and *Statista's* researchers respected the following weights: survey to medical experts (54%), patients' experience (14.5%), hospitals' quality metrics (29%), and PROM questionnaires (2.5%). Based on that, these researchers calculated each hospital's score and position in the ranking. A Global Board of Medical Experts confirmed all results, including reputed doctors from hospitals in the United States, Germany, France, Switzerland, and Israel (*Newsweek*, 2023).

Thanks to the World's Best Hospitals 2023, we listed the 100 best hospitals in the United States (see Appendix 7). We focused on US hospitals for three main reasons. First, American academic medical centers are the most reputed hospitals in the world (Brand Finance, 2023). Second, in America, in 2022, there were 6.129 hospitals and 919.649 staffed beds, which means it was one of the best countries in the world in healthcare infrastructures (American Hospital Association, 2023). Third, in the same year, the United States was the country in the world investing the most in healthcare: 16.6% of the GDP (OECD, 2023).

We analyzed each hospital's corporate website and, more precisely, how these organizations used technological tools (artificial intelligence, big data, social media, mobile apps) to establish more dynamic relationships with their primary stakeholders: a) patients and society; b) media companies; c) public authorities, suppliers and shareholders; and d) employees. We considered these stakeholders because hospitals interested in building a reputed brand must interact with all of them and provide them with meaningful content. Patients are true opinion leaders who can influence other stakeholders' perceptions about the hospital, its medical services, and its employees (Driever, Stiggelbout & Brand, 2020). Media companies contribute to reinforcing hospitals' scientific credibility and social influence (Mheidly & Fares, 2020). Public authorities approve health policies directly influencing hospitals' performance and patients' satisfaction with these organizations (Piculell *et al.*, 2021). Finally, employees play a crucial role when hospitals implement and promote their brand architecture: identity, values, mission, vision and culture (Basha, Rajitha & Afreen, 2022).

From 29th June 2023 to 26th July 2023, we quantitatively analyzed how the 100 best hospitals in the United States managed different technological tools to establish more dynamic relationships with their stakeholders, reinforcing their reputation. Based on the qualitative insights gathered from the literature review and from an initial overview of some US hospitals' corporate websites, we defined 34 indicators that we grouped into four major categories: a) homepage (patients, society); b) online newsroom (media companies); c) about us section (public authorities, suppliers, shareholders); and d) Department of Artificial Intelligence website (employees) –see Table 1–. We only considered each hospital's official website and resorted to the binary system to analyze all indicators.

Table 1. Branding indicators.

1. Homepage: patients and society	2. Online newsroom: media companies	3. About us: public authorities, suppliers, and shareholders	4. Department of artificial Intelligence: employees
<ol style="list-style-type: none"> 1. Hospital's homepage 2. Patient portal 3. Mobile apps 4. Symptom checker 5. Video consultations with doctors 6. Chatbot 7. Interactive maps 8. Virtual tours 9. Interactive health library 10. Podcasts 11. Social media platforms 	<ol style="list-style-type: none"> 1. Newsroom 2. Digital press archives 3. Interactive infographics 4. B-roll videos 5. Podcasts 6. Interactive corporate reports 7. Online translation services 8. Online interviews with doctors 9. Online press conferences 10. News alerts 11. Mobile apps or platforms for journalists 	<ol style="list-style-type: none"> 1. About Us section 2. Videos 3. Interactive infographics 4. Interactive corporate documents 5. Suppliers platform 6. Shareholders platform 	<ol style="list-style-type: none"> 1. Department of Artificial Intelligence 2. Integrating this technology into medical protocols 3. Training employees 4. Conducting research projects 5. Collaboration with universities or research centers 6. Collaboration with external technological partners

Source: Own elaboration.

4. Results

Even if in the United States there are 6.129 hospitals and we only considered 100, this sample was representative since these 100 hospitals are the biggest in the country (number of employees, beds, and patients), as well as those leading research and digital transformation in different areas. Our results proved that most American hospitals resorted to smart branding initiatives to establish better relationships with their stakeholders and promote their reputation. Nevertheless, many hospitals can still improve in this area. We present our results in four major key categories: a) homepage, b) online newsroom, c) About us section, and d) department of artificial intelligence website.

Homepage. All hospitals had a website, a homepage, a patient portal, and an interactive health library. Besides, nearly all of them proposed to patients different online tools: mobile apps (99%), social media platforms (95%), symptom checkers (85%), video consultations with doctors (72%) as well as virtual tours in the hospital (71%). However, only 63% of hospitals displayed podcasts and interactive maps for patients, and 19% used chatbots. On the other hand, 67% of hospitals respected between 8 and 10 indicators, and only eight organizations fulfilled all of them: Mayo Clinic-Rochester, Mayo Clinic-Jacksonville, Mayo Clinic-Phoenix¹, The Mount Sinai Hospital, UCSF Medical Center, U.C. San Diego Health-Jacobs Medical Center, Hackensack University Medical Center, and Christ Hospital.

Online newsroom. All hospitals managed an online newsroom and proposed digital press archives; moreover, most displayed interactive corporate reports (72%). However, few hospitals met the remaining indicators: B-roll videos (41%), news alerts for journalists (37%), interactive infographics (25%), online interviews with doctors (23%), podcasts for journalists (20%), online press conferences (15%), online translation services (8%), and mobile apps or other platforms for journalists (3%). On average, hospitals only respected 4,44 indicators out of 11 applicable. Lastly, the Mayo Clinic was the best hospital in this category (see Table 2).

¹ All hospitals belonging to Mayo Clinic used the same corporate website.

Table 2. Best hospitals: online newsroom.

Hospital	Number of indicators (out of 11)
Mayo Clinic-Rochester, Mayo Clinic-Jacksonville, Mayo Clinic-Phoenix*	10
Cleveland Clinic, Cleveland Clinic Fairview Hospital, Cleveland Clinic-Florida, Cleveland Clinic Akron General**	9
The Mount Sinai Hospital	8
University Hospitals Cleveland Medical Center	8

*All of them used the same corporate website.

**All of them used the same corporate website.

Source: Own elaboration.

About us section. Even if all hospitals had an About Us section, most of them did not respect the six indicators considered: interactive corporate documents (87%), videos (66%), interactive infographics (13%), suppliers platform (0%), and shareholders platform (0%). Indeed, 79% of hospitals only complied with 2-3 indicators. Finally, only 12 hospitals respected four indicators: some of them were UCLA Health-Ronald Reagan Medical Center, UCLA Health-Santa Monica Medical Center, and the University of Colorado Hospital.

Department of Artificial Intelligence. Our results proved that only 23 hospitals had implemented a department specialized in artificial intelligence that collaborated with external organizations –universities, research centers, and technological companies– (see Table 3). On the other hand, 55 hospitals did not have an artificial intelligence department. Still, they developed some projects in this area, and some even collaborated with external organizations such as G E. Healthcare, Vital, Fujifilm, or Medtronics. Finally, 22 hospitals had neither an artificial intelligence department nor research projects in this area. In total, out of the 100 hospitals considered, 78 carried out projects about artificial intelligence, and 60 collaborated with external organizations (universities, research centers, and technological companies).

Table 3. Departments of artificial intelligence.

Hospital	Department	Partnerships with external organizations (universities, research centers)	Partnerships with external organizations (health technological)
Mayo Clinic- Rochester, Mayo Clinic-Jacksonville, Mayo Clinic-Phoenix*	Department of Artificial Intelligence and Informatics	Mayo Clinic College of Medicine & Science	Nvidia
Cleveland Clinic, Cleveland Clinic Fairview Hospital, Cleveland Clinic-Florida, Cleveland Clinic Akron General**	Department of Digital Technologies and Artificial Intelligence	Center for Computational Life Sciences	IBM, PathAI
Massachusetts General Hospital	Surgical Artificial Intelligence and Innovation Laboratory	University of Toronto, MIT	CRICO Risk Management Foundation
Brigham And Women's Hospital, Brigham And Women's Faulkner Hospital***	Center for Clinical Data Science	Dana Farber Cancer Institute	G.E. Healthcare, Nvidia, Fujifilm. Sonosite, Nuance Communications
The Mount Sinai Hospital	Department of Artificial Intelligence and Human Health	National Institute of Neurological Disorders and Stroke, National Institute on Aging	Tau Consortium

Medina Aguerrebere, P., Medina, E. & González Pacanowski, T.
Promoting Hospitals' Reputation through Smart Branding Initiatives.
A Quantitative Analysis of the Best Hospitals in the United States

Cedars-Sinai Medical Center	Division of Artificial Intelligence in Medicine	National Institutes of Health	Chugh Laboratory
UCSF Medical Center	Artificial Intelligence Center	UCSF School of Medicine	Kheiron Medical Technologies, Nvidia
U.C. San Diego Health-Jacobs Medical Center	A.I. Mission Control	U.C. San Diego School of Medicine	Amazon Web Service
University of Colorado Hospital	UCHealth Virtual Health Center	University of Colorado	Catalyst HTI
Keck Hospital of USC	AI Center for Urological Research	USC Norris Comprehensive Cancer Center, USC Verdugo Hills Hospital	
Tufts Medical Center	Biomedical and Health Data Sciences Collaborative	Tufts University School of Medicine	Amazon Web Service, Philips
U.T. Southwestern Medical Center	Program of Excellence in Intelligent Medicine (PEIM)	Cancer Prevention and Research Institute of Texas, National Institutes of Health, Israeli Council for Higher Education	DeepHealth
Ohio State University-Wexner Medical Center	Laboratory for Augmented Intelligence in Imaging	Ohio State University	Nvidia
University of Maryland Medical Center	Institute for Health Computing (UM-3-IHC)	University of Maryland in Baltimore, University of Maryland College Park	Sophia Genetics
Umass Memorial Medical Center	Pulmonary Artificial Intelligence and Radiomics Research	UMass Chan Medical School, Center-of-Excellence	DeepHealth
Tampa General Hospital	CareComm Command Center	University of South Florida Morsani College of Medicine	Enroute, Navina, G.E. Healthcare
Maine Medical Center	MaineHealth Innovation Department	Northeastern University's Roux Institute, University of Maine, University of Southern Maine	Maine Technology Institute

*They all collaborated with the same artificial intelligence department and external partners.

** They all collaborated with the same artificial intelligence department and external partners.

*** They all collaborated with the same artificial intelligence department and external partners.

Source: Own elaboration.

Concerning the 23 hospitals having an artificial intelligence department, all tried to integrate this technology into different medical protocols, trained their employees to use artificial intelligence, developed research projects in this area, and collaborated with universities and research centers. Finally, 95.65% of them respected the six criteria considered (see Table 4).

Table 4. Best hospitals: department of artificial intelligence.

Hospital	Number of criteria
Mayo Clinic-Rochester, Mayo Clinic-Jacksonville, Mayo Clinic-Phoenix*	6
Cleveland Clinic, Cleveland Clinic Fairview Hospital, Cleveland Clinic-Florida, Cleveland Clinic Akron General**	6
Brigham And Women's Hospital, Brigham And Women's Faulkner Hospital***	6
The Mount Sinai Hospital, Cedars-Sinai Medical Center, UCSF Medical Center, U.C. San Diego Health-Jacobs Medical Center, University of Colorado Hospital, Tufts Medical Center, UT Southwestern Medical Center, Massachusetts General Hospital, Ohio State University-Wexner Medical Center, University of Maryland Medical Center, Umass Memorial Medical Center, Tampa General Hospital, Maine Medical Center	6
Keck Hospital of USC	5

*All of them collaborated with the same department of artificial intelligence.

**All of them collaborated with the same department of artificial intelligence.

***All of them collaborated with the same department of artificial intelligence.

Source: Own elaboration.

According to our results, many American hospitals professionally managed their homepages, online newsrooms, about us sections, and Department of Artificial Intelligence websites. However, not all of them resorted to the same tools. To conclude, we can state that 53% of hospitals respected between 12-16 criteria and that the best one was the Mayo Clinic (see table 5).

Table 5. Best hospitals: smart branding initiatives.

Hospital	Number of criteria (out of 34)
Mayo Clinic-Rochester, Mayo Clinic-Jacksonville, Mayo Clinic-Phoenix*	30
Cleveland Clinic, Cleveland Clinic Fairview Hospital, Cleveland Clinic-Florida, Cleveland Clinic Akron General**	28
The Mount Sinai Hospital	28
U.T. Southwestern Medical Center	26
Ohio State University-Wexner Medical Center	26

*All of them used the same corporate website.

**All of them used the same corporate website.

Source: Own elaboration.

5. Discussion

Building a reputed brand constitutes a priority for hospitals. To achieve this goal, each organization implements initiatives consistent with the company's business objectives. Our results proved that some American hospitals belonging to the same organizational group used the same corporate websites²; others prioritized artificial intelligence from a medical perspective but not from a communication standpoint; and finally, other hospitals focused primarily on their online newsrooms. Regardless of that, most American hospitals implemented branding

² a) Mayo Clinic-Rochester, Mayo Clinic-Jacksonville, and Mayo Clinic-Phoenix.

b) Cleveland Clinic, Cleveland Clinic Fairview Hospital, Cleveland Clinic Florida, and Cleveland Clinic Akron General.

c) The Johns Hopkins Hospital, and Johns Hopkins Bayview Medical Center.

d) Brigham And Women's Hospital, and Brigham And Women's Faulkner Hospital.

e) Northwestern Memorial Hospital, and Northwestern Medicine Central DuPage Hospital.

f) Emory University Hospital, and Emory Saint Joseph's Hospital.

g) Inova Fairfax Hospital, and Inova Alexandria Hospital.

h) Indiana University Health West Hospital, and Indiana University Health-North Hospital.

initiatives to improve their relationships with stakeholders: patients, society, media companies, public authorities, suppliers, shareholders, and employees.

Promoting a hospital brand involves focusing on content that helps patients and society improve their quality of life (Lithopoulos *et al.*, 2021). For this reason, many hospitals train patients in health literacy and communication skills (Ancker, Grossman & Benda, 2020). These skills help them participate actively in shared decision-making processes with doctors (Bol, Smit & Lustria, 2020). Indeed, our results proved that most American hospitals followed this logic and proposed on their website different tools to reinforce their patient empowerment: patient portal (100%), interactive health libraries (100%), and symptom checkers (85%). However, only 19% of hospitals displayed chatbots that patients could use to find information and interact with the organization more efficiently.

Besides patients, hospitals interact with media companies and provide them with high-quality healthcare content (Mheidly & Fares, 2020). This content must be consistent with the hospital's mission statement (Singla & Sharma, 2021) and adapted to each media company's information needs (Merminod & Benaroyo, 2021). According to our results, all American hospitals managed an online newsroom. However, many did not use this platform efficiently: only 41% of hospitals proposed B-roll videos, and only 3% had an app or an online platform for external journalists. Lastly, 65% of hospitals only respected between 2 and 4 criteria out of 11 applicable, proving that most American hospitals can still improve in this area.

Hospitals use About Us sections to interact with public authorities, suppliers, and shareholders. Nevertheless, most hospitals analyzed in this paper did not efficiently manage this section. Our results showed no hospital had a platform for suppliers or shareholders. The only content available in this section was corporate documents (87%) and videos (66%). Nevertheless, this generic information does not contribute to build rich relationships with public authorities, suppliers, and shareholders. That is why, hospitals must carry out research about their stakeholders' information needs (Jenkins *et al.*, 2020) and, based on that, share meaningful content that helps them understand better the hospital's brand (Barredo *et al.*, 2021; Rahman, Langner & Temme, 2021).

Many hospitals use artificial intelligence to improve their internal processes and patients' medical outcomes (Shilo, Rossman & Segal, 2020). Thanks to this technology, hospitals have become more efficient organizations, which help doctors and nurses reinforce their sense of belonging (Hart & Phau, 2022). In other words, artificial intelligence contributes to building a more credible hospital brand (LV & Qiao, 2020). According to our results, most American hospitals prioritized artificial intelligence for medical purposes: in fact, 78% of them developed projects in this area, and most of them collaborated with external partners such as universities, research centers, or technological companies (60%). Moreover, 23 hospitals had implemented an in-house department specialized in this area, such as Mount Sinai Hospital (Department of Artificial Intelligence and Human Health), Cedars-Sinai Medical Center (Division of Artificial Intelligence in Medicine), or UCSF Medical Center (Artificial Intelligence Center). Thanks to these investments in artificial intelligence, American hospitals improved their organization from a medical perspective, but also from a branding perspective.

This paper contributes to a better understanding of how the best American hospitals managed different technological tools (corporate websites, online newsrooms, About Us section, and artificial intelligence) to build a reputed brand. Thanks to our research, we confirmed that many hospitals can still enhance their practices when using smart technologies for branding purposes: developing meaningful content that describes the brand and educates patients on different medical areas remains a strategic opportunity that many hospitals are not considering. In other words, this paper proved that many American hospitals still need to professionalize their branding initiatives addressed to different stakeholder. Despite the interesting facts described in this paper, we must highlight three main limitations: a) we did not have access to each hospital's corporate communication department, which prevented us

from better understanding the role of technology in their branding initiatives; b) we did not analyze stakeholders' perceptions about smart branding initiatives; and c) we did not consider the legal framework regulating health communication in the United States. In the coming years, researchers interested in this area should focus on integrating smart technology with meaningful content, branding elements, and hospitals' internal protocols. Their main research objective should be developing new branding models for hospitals. To do that, they can explore different topics, such as the impact of artificial intelligence on health education programs addressed to patients, the role of doctors and nurses in hospitals' branding models, or the integration of smart branding models into the hospital's medical protocols.

6. Conclusion

Hospitals resort to websites, online newsrooms, about us sections, social media platforms, mobile apps, and artificial intelligence to improve their internal functioning, reinforce relationships with stakeholders, and build a more reputed brand. However, these organizations face several obstacles: limited budgets for corporate communication, stakeholders' additional needs, strict legal frameworks, etc. This paper aimed to analyse how the best American hospitals managed smart technologies to improve their relationships with stakeholders and reinforce their brand. Also, is the first one to break down the concept of hospital branding into 34 tangible measurable indicators that hospitals should respect when using online platforms to interact with their stakeholders. This practical approach will help these organizations realize their communication mistakes and improve their branding practices. We can conclude this article with three main ideas.

First, when implementing smart branding initiatives, most American hospitals focused on patients rather than other targets (media companies, suppliers, shareholders, or public authorities). Even if all hospitals had a homepage, an online newsroom, and an about us section, not all of them respected the criteria in each section: homepage (8.67 out of 11), online newsrooms (4.44 out of 11), about us section (2.66 out of 6). Besides, only 23% of hospitals had implemented an artificial intelligence department. Prioritizing patients constitutes a smart decision; however, hospitals must implement collective branding processes involving all stakeholders, including employees, media companies, and public authorities. Second, many American hospitals resorted to artificial intelligence to accelerate their scientific research and enhance their patient's medical outcomes (78%); nevertheless, most of them did not communicate enough about this area on their corporate communication tools: homepage, online newsroom, about us section, social media platforms, etc. These organizations should make artificial intelligence projects more visible in their smart branding initiatives and, in this way, use these projects to reinforce the hospital's brand value. Third, our results proved that 53% of hospitals only respected between 12 and 16 indicators out of 34 applicable. The most common tools used in each platform were: patient portal and interactive health library –100%– (*homepage*); digital press archives –100%– (*online newsroom*); interactive corporate documents –87%– (*about us section*); integrating artificial intelligence into medical protocols, training employees, research projects, collaboration with universities –100%– (*department of artificial intelligence*). This fact revealed that these organizations can still improve on how to use smart technologies for branding purposes. To do that, they need to recruit experts in corporate communication who implement branding strategies, annual content plans, and evaluation systems.

The authors declare no conflict of interest with private or public institutions. All ethical principles of research have been respected. No public or private entity has financed this article.

References

- Agarwal, A., Pelullo, A., & Merchant, R. (2019). "Told": the Word Most Correlated to Negative Online Hospital Reviews. *Journal of General Internal Medicine*, 34, 1079–1080.
<https://www.doi.org/10.1007/s11606-019-04870-6>
- American Hospital Association (2023). *Fast Facts on US Hospitals 2023*. Retrieved from <https://www.aha.org/statistics/fast-facts-us-hospitals>
- Ancker, J., Grossman, L. & Benda, N. (2020). Health Literacy 2030: Is It Time to Redefine the Term? *Journal of General Internal Medicine*, 35(8), 2427–2430.
<https://www.doi.org/10.1007/s11606-019-05472-y>
- Barredo Ibáñez, D., Molina Rodríguez-Navas, P., Medranda Morales, N. & Rodríguez Breijo, V. (2021). Health Transparency and Communication on the Government Websites of Ibero-American Countries: The Cases of Chile, Colombia, Ecuador, and Spain. *International Journal of Environmental Research and Public Health*, 18(12), 6222.
<https://www.doi.org/10.3390/ijerph18126222>
- Barrett, A., Ford, J., & Zhu, Y. (2023). Communication Overload in Hospitals: Exploring Organizational Safety Communication, Worker Job Attitudes, and Communication Efficacy. *Health Communication*, 38(13), 2971–2985.
<https://www.doi.org/10.1080/10410236.2022.2129313>
- Basha, A., Rajitha, N. & Afreen, R. (2022). Employer Branding: A New Facet of Health Care Sector. *International Journal of Engineering and Technical Research*, 9(11), 224–228. Retrieved from <https://www.ijert.org/employer-branding-a-new-facet-of-health-care-sector>
- Bassan, S. (2020). Data Privacy Considerations for Telehealth Consumers amid COVID-19. *Journal of Law and the Biosciences*, 7 (1). <https://www.doi.org/10.1093/jlb/l5aao75>
- Belani, S., Tiarks, G., Mookerjee, N. & Rajput, V. (2021). "I Agree to Disagree": Comparative Ethical and Legal Analysis of Big Data and Genomics for Privacy, Consent, and Ownership. *Cureus*, 13(10), e18736. <https://www.doi.org/10.7759/cureus.18736>
- Berg, S., O'Hara, J., Shortt, M., Thune, H., Brønnick, K., Lungu, D., Røislien, J. & Wiig, S. (2021). Health Authorities' Health Risk Communication with the Public during Pandemics: a Rapid Scoping Review. *BMC Public Health*, 21(1), 1401. <https://www.doi.org/10.1186/s12889-021-11468-3>
- Bhanot, K., Qi, M., Erickson, J., Guyon, I. & Bennett, K. (2021). The Problem of Fairness in Synthetic Healthcare Data. *Entropy*, 23(9), 1165. <https://www.doi.org/10.3390/e23091165>
- Bol, N., Smit, E. & Lustria, M. (2020). Tailored Health Communication: Opportunities and Challenges in the Digital Era. *Digital Health*, 6, 2055207620958913.
<https://www.doi.org/10.1177/2055207620958913>
- Brand Finance (2023). *Global Top 250 Hospitals 2023*. London: Brand Finance.
- Burr, C., Taddeo, M. & Floridi, L. (2020). The Ethics of Digital Well-Being: A Thematic Review. *Science and Engineering Ethics*, 26, 2313–2343. <https://www.doi.org/10.1007/s11948-020-00175-8>
- Butow, P. & Hoque, E. (2020). Using artificial intelligence to analyse and teach communication in Healthcare. *Breast*, 50, 49–55. <https://www.doi.org/10.1016/j.breast.2020.01.008>
- Chamberlain, S., Dutt, P., Godfrey, A., Mitra, R., Lefevre, A., Scott, K., Mendiratta, J., Chauhan, V. & Arora, S. (2021). Ten Lessons Learnt: Scaling and Transitioning One of the Largest Mobile Health Communication Programmes in the World to a National Government. *BMJ Global Health*, 6, e005341. <https://www.doi.org/10.1136/bmjgh-2021-005341>
- Chen, J. & Wang, Y. (2021). Social Media Use for Health Purposes: Systematic Review. *Journal of Medical Internet Research*, 23(5), e17917. <https://www.doi.org/10.2196/17917>

- Confente, I. & Kucharska, W. (2021). Company versus Consumer Performance: Does Brand Community Identification Foster Brand Loyalty and the Consumer's Personal Brand? *Journal of Brand Management*, 28, 8–31. <https://www.doi.org/10.1057/s41262-020-00208-4>
- Crossley, S., Balyan, R., Liu, J., Karter, A., McNamara, D. & Schillinger, D. (2020). Predicting the Readability of Physicians' Secure Messages to Improve Health Communication Using Novel Linguistic Features: Findings from the ECLIPSE Study. *Journal of Community Health*, 13(4), 1–13. <https://www.doi.org/10.1080/17538068.2020.1822726>
- Dang, Y., Guo, S., Guo, X., Wang, M. & Xie, K. (2021). Privacy Concerns About Health Information Disclosure in Mobile Health: Questionnaire Study Investigating the Moderation Effect of Social Support. *JMIR mHealth and uHealth*, 9(2), e19594. <https://www.doi.org/10.2196/19594>
- Dhagarra, D., Goswami, M. & Kumar, G. (2020). Impact of Trust and Privacy Concerns on Technology Acceptance in Healthcare: An Indian Perspective. *International Journal of Medical Informatics*, 11 (141), 104164. <https://www.doi.org/10.1016/j.ijmedinf.2020.104164>
- Driever, E., Stiggelbout, A. & Brand, P. (2020). Shared Decision Making: Physicians' Preferred Role, Usual Role and Their Perception of its Key Components. *Patient Education and Counseling*, 103 (1), 77–82. <https://www.doi.org/10.1016/j.pec.2019.08.004>
- Esmailzadeh, P. (2020). Use of AI-based Tools for Healthcare Purposes: a Survey Study from Consumers' Perspectives. *BMC Medical Informatics and Decision Making*, 20, 170. <https://www.doi.org/10.1186/s12911-020-01191-1>
- Fazal, R., Shah, M., Khattak, H., Rauf, H. & Al-Turjman, F. (2022). Achieving Data Privacy for Decision Support Systems in Times of Massive Data Sharing. *Cluster Computing*, 25(18), 1–13. <https://www.doi.org/10.1007/s10586-021-03514-X>
- Franz, B., Skinner, D., Kerr, A., Penfold, R., & Kelleher, K. (2018). Hospital-Community Partnerships: Facilitating Communication for Population Health on Columbus' South Side. *Health Communication*, 33(12), 1462–1474. <https://www.doi.org/10.1080/10410236.2017.1359033>
- Galvin, H. & DeMuro, P. (2020). Developments in Privacy and Data Ownership in Mobile Health Technologies, 2016–2019. *Yearbook of Medical Informatics*, 29(1), 32–43. <https://www.doi.org/10.1055/s-0040-1701987>
- Govers, R. (2020). Imaginative Communities and Place Branding. *Place Branding and Public Diplomacy*, 16(1), 1–5. <https://www.doi.org/10.1057/s41254-019-00143-5>
- Harrison, B., Cockrell, S., Ferrell, B., & Edison, W. (2022) The Influence of Financial Performance on Marketing Expenditures among U.S. Hospitals Participating in the Medicare Program. *Health Marketing Quarterly*, 39(2), 150–158. <https://www.doi.org/10.1080/07359683.2021.1994169>
- Hart, B. & Phau, I. (2022). Conceptualizing Attitudes towards Brand Genuinity: Scale Development and Validation. *Journal of Brand Management*, 29, 327–340. <https://www.doi.org/10.1057/s41262-022-00272-y>
- Hathaway, J., Tarini, B., Banerjee, S., Smolkin, C., Koos, J., & Pati, S. (2023) Healthcare Team Communication Training in the United States: A Scoping Review. *Health Communication*, 38(9), 1821–1846. <https://www.doi.org/10.1080/10410236.2022.2036439>
- Howe, E. & Elenberg, F. (2020). Ethical Challenges Posed by Big Data. *Innovations in Clinical Neuroscience*, 17(10), 24–30. <https://www.doi.org/10.1007/s10067-020-04969-w>
- Jenkins, E., Ilicic, J., Barklamb, A. & McCaffrey, T. (2020). Assessing the Credibility and Authenticity of Social Media Content. Lessons and Applications for Health Communication: A Scoping Review of the Literature. *Journal of Medical Internet Research*, 22(7), e17296. <https://www.doi.org/10.2196/17296>
- Jiang, D. & Shi, G. (2021). Research on Data Security and Privacy Protection of Wearable Equipment in Healthcare. *Journal of Healthcare Engineering*, 6656204. <https://www.doi.org/10.1155/2021/6656204>

- Kaissis, G., Makowski, M., Rückert, D. & Braren, R. (2020). Secure, Privacy-preserving, and Federated Machine Learning in Medical Imaging. *Nature Machine Intelligence*, 2, 305–311. <https://www.doi.org/10.1038/s42256-020-0186-1>
- Khosravizadeh, O., Vatankhah, S., Baghian, N., Shahsavari, S., Ghaemmohamadi, M. & Ahadinezhad, B. (2021). The Branding Process for Healthcare Centers: Operational Strategies from Consumer's Identification to Market Development. *International Journal of Healthcare Management*, 14(4), 956–964. <https://www.doi.org/10.1080/20479700.2020.1723881>
- Kim, D. & Kreps, G. (2020). An Analysis of Government Communication in the United States During the COVID-19 Pandemic: Recommendations for Effective Government Health Risk Communication. *World Medical & Health Policy*, 12. <https://www.doi.org/10.1002/wmh3.363>
- Lee, Y., In, J. & Lee, S.J. (2020). Social Media Engagement, Service Complexity, and Experiential Quality in U.S. Hospitals. *Journal of Services Marketing*, 34(6), 833–845. <https://www.doi.org/10.1108/JSM-09-2019-0359>
- Li, J., Tian, S., Carter, J. & Wen, J. (2021). More than the Bottom Line: Exploring Social Responsibility Practices in Hospital Settings in the United States. *Health Marketing Quarterly*, 38 (4), 297–314. <https://www.doi.org/10.1080/07359683.2020.1814616>
- Li, Z. & Xu, J. (2020). Medicine together with Humanities and Media: An MHM Model to Move Forward for Health Communication Studies. *International Journal of Nursing Sciences*, 7(1), S1–S3. <https://www.doi.org/10.1016/j.ijnss.2020.07.011>
- Lin, L. & Hou, Z. (2020). Combat COVID-19 with Artificial Intelligence and Big Data. *Journal of Travel Medicine*, 27(5), taaa080. <https://www.doi.org/10.1093/jtm/taaa080>
- Lithopoulos, A., Evans, D., Faulkner, G. & Rhodes, R. (2021). Marketing Physical Activity? Exploring the Role of Brand Resonance in Health Promotion. *Journal of Health Communication*, 26(10), 675–683. <https://www.doi.org/10.1080/10810730.2021.1989524>
- Luo, Y., Oh, C., Jean, B. & Choe, E. (2020). Interrelationships Between Patients' Data Tracking Practices, Data Sharing Practices, and Health Literacy: Onsite Survey Study. *Journal of Medical Internet Research*, 22(12), e18937. <https://www.doi.org/10.2196/18937>
- Lv, Z. & Qiao, L. (2020). Analysis of Healthcare Big Data. *Future Generation Computer Systems*, 109(1). <https://www.doi.org/10.1016/j.future.2020.03.039>
- Mackert, M., Mandell, D., Donovan, E., Walker, L., García, M. & Bouchacourt, L. (2020). Mobile Apps as Audience-Centered Health Communication Platforms. *JMIR mHealth and uHealth*, 9(8), e25425. <https://www.doi.org/10.2196/preprints.25425>
- Mahmoud, M., Daboos, M., Gouda, S., Othman, A., Abdelmaboud, M., Hussein, M. & Akl, M. (2022). Telemedicine (Virtual Clinic) Effectively Delivers the Required Healthcare Service for Pediatric Ambulatory Surgical Patients during the Current Era of COVID-19 Pandemic: A Mixed Descriptive Study. *Journal of Pediatric Surgery*, 57(4), 630–636. <https://www.doi.org/10.1016/j.jpedsurg.2021.11.018>
- Manrique de Lara, A. & Peláez-Ballestas, I. (2020). Big Data and Data Processing in Rheumatology: Bioethical Perspectives. *Clinical Rheumatology*, 39(4), 1007–1014. <https://www.doi.org/10.1007/s10067-020-04969-w>
- Martin, G., Khajuria, A., King, D., Arora, S., Ashrafian, H., & Darzi, A. (2018). The Impact of Mobile Technology on Teamwork and Communication in Hospitals: A Systematic Review. *Journal of the American Medical Informatics Association*, 26(4), 339–355. <https://www.doi.org/10.1093/jamia/ocy175>
- Mason, A., Narcum, J., Mason, K., & Awan, U. (2021). Social Media Marketing Gains Importance after COVID-19. *Cogent Business & Management*, 8(1). <https://www.doi.org/10.1080/23311975.2020.1870797>

- McFarland, D., Shen, M., & Holcombe, R. (2017). Predictors of Satisfaction With Doctor and Nurse Communication: A National Study. *Health Communication, 32*(10), 1217–1224.
<https://www.doi.org/10.1080/10410236.2016.1215001>
- Medina Aguerrebere, P., Pacanowski, T. & Medina, E. (2020). Stakeholders' Participation in Hospitals' Branding Initiatives on Social Media: A Proposal Model for Building Collective Brands. *Revista Española de Comunicación en Salud, 11*(1).
<https://www.doi.org/10.20318/recs.2020.5097>
- Merminod, G. & Benaroyo, L. (2021). Ethical Issues in Public Health Communication: Practical Suggestions from a Qualitative Study on Campaigns about Organ Donation in Switzerland. *Patient Education and Counseling, 105*(4), 881–886.
<https://www.doi.org/10.1016/j.pec.2021.07.012>
- Mheidly, N. & Fares, J. (2020). Leveraging Media and Health Communication Strategies to Overcome the COVID-19 Infodemic. *Journal of Public Health Policy, 41*(4), 410–420.
<https://www.doi.org/10.1057/s41271-020-00247-w>
- Mina, A. (2020). Big data e inteligencia artificial en el futuro manejo de pacientes. ¿Por dónde empezar? ¿En qué punto nos encontramos? ¿Quo tendimus? *Avances en Medicina de Laboratorio, 1*. <https://www.doi.org/10.1515/almed-2020-0052>
- Molnár-Gábor, F. & Korbel, J. (2020). Genomic Data Sharing in Europe is Stumbling—Could a Code of Conduct Prevent its Fall? *EMBO Molecular Medicine, 12*(3), e11421.
<https://www.doi.org/10.15252/emmm.201911421>
- Naeem, M., & Ozuem, W. (2021). Exploring the Use of Social Media Sites for Health Professionals' Engagement and Productivity in Public Sector Hospitals. *Employee Relations, 43* (5), 1029–1051. <https://www.doi.org/10.1108/ER-08-2020-0391>
- Nageshwaran, G., Harris, R. & Guerche-Seblain, C. (2021). Review of the Role of Big Data and Digital Technologies in Controlling COVID-19 in Asia: Public Health Interest vs. Privacy. *Digital Health, 7*, 20552076211002953. <https://www.doi.org/10.1177/20552076211002953>
- Nandyal, S., Strawhun, D., Stephen, H., Banks, A., & Skinner, D. (2021). Building Trust in American Hospital-Community Development Projects: a Scoping Review. *Journal of Community Hospital Internal Medicine Perspectives, 11*(4), 439–445.
<https://www.doi.org/10.1080/20009666.2021.1929048>
- Newsweek (2023). *World's Best Hospitals 2023*. Information retrieved on 29th June 2023 from <https://www.newsweek.com/rankings/worlds-best-hospitals-2023>
- Ni, Z., Wang, Y. & Qian, Y. (2021). Privacy Policy Compliance of Chronic Disease Management Apps in China: Scale Development and Content Evaluation. *JMIR mHealth and uHealth, 9*(1), e23409. <https://www.doi.org/10.2196/23409>
- Nittari, G., Khuman, R., Baldoni, S., Pallotta, G., Battineni, G., Sirignano, A., Amenta, F. & Ricci, G. (2020). Telemedicine Practice: Review of the Current Ethical and Legal Challenges. *Telemedicine and eHealth, 26*(12), 1427–1437. <https://www.doi.org/10.1089/tmj.2019.0158>
- Odoom, P., Narteh, B. & Odoom, R. (2019). Healthcare Branding: Insights from Africa into Health Service Customers' Repeat Patronage Intentions. *International Journal of Healthcare Management, 14*(1), 1–13. <https://www.doi.org/10.1080/20479700.2019.1688503>
- OECD (2023). *OECD Health Statistics 2023*. Retrieved from <https://www.oecd.org/els/health-systems/health-data.htm>
- Olson, O., Berry, C. & Kumar, N. (2020). Addressing Parental Vaccine Hesitancy towards Childhood Vaccines in the United States: A Systematic Literature Review of Communication Interventions and Strategies. *Vaccines, 8*(4), 590.
<https://www.doi.org/10.3390/vaccines8040590>
- Parkinson, J., & Davey, J. (2023). The Importance of Health Marketing and a Research Agenda. *Health Marketing Quarterly, 40*(4), 347–351.
<https://www.doi.org/10.1080/07359683.2024.2271780>

- Parsons, C., Hron, J. & Bourgeois, F. (2020). Preserving Privacy for Pediatric Patients and Families: Use of Confidential Note Types in Pediatric Ambulatory Care. *Journal of the American Medical Informatics Association*, 27(11).
<https://www.doi.org/10.1093/jamia/ocaa202>
- Piculell, E., Skär, L., Sanmartin, J., Anderberg, P. & Bohman, D. (2021). Using a Mobile Application for Health Communication to Facilitate a Sense of Coherence: Experiences of Older Persons with Cognitive Impairment. *International Journal of Environmental Research and Public Health*, 18(21), 11332. <https://www.doi.org/10.3390/ijerph182111332>
- Rahman, R., Langner, T. & Temme, D. (2021). Brand love: Conceptual and Empirical Investigation of a Holistic Causal Model. *Journal of Brand Management*, 28(1), 609–642. <https://www.doi.org/10.1057/s41262-021-00237-7>
- Ramón Fernández, F. (2021). Inteligencia artificial en la relación médico-paciente: algunas cuestiones y propuestas de mejora. *Revista Chilena de Derecho y Tecnología*, 10(1), 329–351. <https://www.doi.org/10.5354/0719-2584.2021.60931>
- Reed-Berendt, R., Dove, E. & Pareek, M. (2020). UK-REACH Study Collaborative Group. The Ethical Implications of Big Data Research in Public Health: “Big Data Ethics by Design” in the UK-REACH Study. *Ethics and Human Research*, 44(1), 2–17. <https://www.doi.org/10.1002/eahr.500111>
- Rubeis, G. (2022). iHealth: The ethics of Artificial Intelligence and Big Data in Mental Healthcare. *Internet Interventions*, 28, 100518. <https://www.doi.org/10.1016/j.invent.2022.100518>
- Schmit, C., Ajayi, K., Ferdinand, A., Giannouchos, T., Ilangovan, G., Nowell, B. & Kum, H. (2020). Communicating With Patients About Software for Enhancing Privacy in Secondary Database Research Involving Record Linkage: Delphi Study. *Journal of Medical Internet Research*, 22(12), e20783. <https://www.doi.org/10.2196/20783>
- Schwartz, L. & Woloshin, S. (2019). Medical Marketing in the United States, 1997–2016. *JAMA*, 321(1), 80–96. <https://www.doi.org/10.1001/jama.2018.19320>
- Shafiee, R., Ansari, F. & Mahjob, H. (2022). Physicians' Brand Personality: Building Brand Personality Scale. *Services Marketing Quarterly*, 43(1), 48–66. <https://www.doi.org/10.1080/15332969.2021.1989890>
- Shi, M., Jiang, R., Hu, X. & Shang, J. (2020). A Privacy Protection Method for Health Care Big Data Management Based on Risk Access Control. *Health Care Management Science*, 23(3), 427–442. <https://www.doi.org/10.1007/s10729-019-09490-4>
- Shieh, G., Wu, S., Tsai, C., Chang, C., Chang, T., Lui, P., Yao, Y. & Sheu, W. (2020). A Strategic Imperative for Promoting Hospital Branding: Analysis of Outcome Indicators. *Interactive Journal of Medical Research*, 9(1), e14546. <https://www.doi.org/10.2196/14546>
- Shilo, S., Rossman, H. & Segal, E. (2020). Axes of a Revolution: Challenges and Promises of Big Data in Healthcare. *Nature Medicine*, 26, 29–38. <https://www.doi.org/10.1038/s41591-019-0727-5>
- Singla, V. & Sharma, N. (2021). Understanding the Role of Fonts in Linking Brand Identity to Brand Perception. *Corporate Reputation Review*, 25, 272–286. <https://www.doi.org/10.1057/s41299-021-00127-3>
- Tangari, G., Ikram, M., Ijaz, K., Kaafar, M. & Berkovsky, S. (2021). Mobile Health and Privacy: Cross-Sectional Study. *BMJ*, 373, n1248. <https://www.doi.org/10.1136/bmj.n1248>
- Tom, E., Keane, P., Blazes, M., Pasquale, L., Chiang, M., Lee, A., Lee, C. * AAO Artificial Intelligence Task Force (2020). Protecting Data Privacy in the Age of AI-Enabled Ophthalmology. *Translational Vision Science and Technology*, 9(2), 36. <https://www.doi.org/10.1167/tvst.9.2.36>
- Triemstra, J., Poeppelman, R. & Arora, V. (2018). Correlations Between Hospitals' Social Media Presence and Reputation Score and Ranking: Cross-Sectional Analysis. *Journal of Medical Internet Research*, 20(11), e289. <https://www.doi.org/10.2196/jmir.9713>

- Tsai, W., Lun, D., Carcioppolo, N. & Chuan, C. (2021). Human versus Chatbot: Understanding the Role of Emotion in Health Marketing Communication for Vaccines. *Psychology and Marketing*, 34539051. <https://www.doi.org/10.1001/10.1002/mar.21556>
- Tseng, H., Hung, W., Hwang, H. & Chang, I. (2020). Do Patients' Privacy Concerns Influence Their Intention toward Medical Image Exchange Consent in Taiwan? *Healthcare*, 8(1), 14. <https://www.doi.org/10.3390/healthcare8010014>
- Véliz, C. (2019). Not the Doctor's Business: Privacy, Personal Responsibility and Data Rights in Medical Settings. *Bioethics*, 34(7), 712-718. <https://www.doi.org/10.1111/bioe.12711>
- Xifra, J. (2020). Comunicación corporativa, relaciones públicas y gestión del riesgo reputacional en tiempos del Covid-19. *El Profesional de la Información*, 29(2), e290220. <https://www.doi.org/10.3145/epi.2020.mar.20>
- Zerka, F., Barakat, S., Walsh, S., Bogowicz, M., Leijenaar, R., Jochems, A., Miraglio, B., Townend, D. & Lambin, P. (2020). Systematic Review of Privacy-Preserving Distributed Machine Learning from Federated Databases in Health Care. *JCO Clinical Cancer Informatics*, 4, 184-200. <https://www.doi.org/10.1200/CCI.19.00047>

Appendix 1. List of hospitals analyzed

1. Mayo Clinic-Rochester
2. Cleveland Clinic
3. Massachusetts General Hospital
4. The Johns Hopkins Hospital
5. UCLA Health-Ronald Reagan Medical Center
6. Stanford Health Care-Stanford Hospital
7. Brigham And Women's Hospital
8. Northwestern Memorial Hospital
9. The Mount Sinai Hospital
10. New York-Presbyterian Hospital-Columbia and Cornell
11. University of Michigan Hospitals-Michigan Medicine
12. Cedars-Sinai Medical Center
13. UCSF Medical Center
14. Duke University Hospital
15. Hospital of the University of Pennsylvania-Penn Presbyterian
16. NYU Langone Hospitals
17. Mayo Clinic-Jacksonville
18. Rush University Medical Center
19. Mayo Clinic-Phoenix
20. Houston Methodist Hospital
21. UCLA Health-Santa Monica Medical Center
22. Beth Israel Deaconess Medical Center
23. University of Chicago Medical Center
24. Vanderbilt University Medical Center
25. University of Wisconsin Hospitals
26. U.C. San Diego Health-Jacobs Medical Center
27. University of Washington Medical Center
28. University of Colorado Hospital
29. University Hospitals Cleveland Medical Center
30. University of California-Davis Medical Center
31. Yale New Haven Hospital
32. University of Utah Hospital
33. Barnes-Jewish Hospital
34. Emory University Hospital
35. Scripps Memorial Hospital La Jolla
36. University of Kansas Hospital
37. Virginia Mason Medical Center
38. Cleveland Clinic Fairview Hospital
39. Keck Hospital of USC
40. Torrance Memorial Medical Center
41. Tufts Medical Center
42. University of Virginia Medical Center
43. OHSU Hospital
44. UT Southwestern Medical Center
45. Cleveland Clinic-Florida
46. Morristown Medical Center
47. Baylor University Medical Center
48. Baylor St. Luke's Medical Center
49. Johns Hopkins Bayview Medical Center

50. UAB Hospital
51. Brigham And Women's Faulkner Hospital
52. Mercy Hospital St. Louis
53. CentraCare-St. Cloud Hospital
54. Jefferson Health-Thomas Jefferson University Hospitals
55. Sanford USD Medical Center
56. Providence St. Vincent Medical Center
57. Hackensack University Medical Center
58. UPMC Presbyterian & Shadyside
59. St. Luke's Hospital of Kansas City
60. M Health Fairview University of Minnesota Medical Center-West Bank East
61. Nebraska Medicine-Nebraska Medical Center
62. Northwestern Medicine Central DuPage Hospital
63. St. Luke's Regional Medical Center
64. Penn State Health-Milton S. Hershey Medical Center
65. Ohio State University-Wexner Medical Center
66. VCU Medical Center
67. Memorial Hermann-Texas Medical Center
68. Medical City Dallas Hospital
69. Loyola University Medical Center
70. Mayo Clinic-Health System In Eau Claire
71. UnityPoint Health-Meriter
72. Inova Fairfax Hospital
73. Christ Hospital
74. Froedtert Hospital and the Medical College of Wisconsin
75. Indiana University Health West Hospital
76. Penn Medicine Chester County Hospital
77. University of Maryland Medical Center
78. Sharp Memorial Hospital
79. UNC REX Hospital
80. UMass Memorial Medical Center
81. ChristianaCare
82. Henry Ford Hospital
83. Atrium Health Carolinas Medical Center
84. Tampa General Hospital
85. Newton-Wellesley Hospital
86. St. Joseph Mercy Chelsea
87. Cleveland Clinic Akron General
88. Intermountain Medical Center
89. University of North Carolina Hospitals
90. Maine Medical Center
91. Advocate Good Samaritan Hospital
92. MemorialCare Long Beach Medical Center
93. Luminis Health Anne Arundel Medical Center
94. Indiana University Health-North Hospital
95. El Camino Hospital
96. Aurora St. Luke's Medical Center
97. Emory Saint Joseph's Hospital
98. University of Iowa Hospitals and Clinics
99. The Moses H. Cone Memorial Hospital
100. Inova Alexandria Hospital