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## MEDIA & COMMUNICATION STUDIES | RESEARCH ARTICLE

# Analysis and study of hospital communication via social media from the patient perspective

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**Abstract:** Currently, the online interaction between citizens and hospitals is poor, as users believe that there are shortcomings that could be improved. This study analyzes patients' opinions of the online communication strategies of hospitals in Spain. Therefore, a mixed-method is proposed. Firstly, a qualitative analysis through a focus-group was carried out, so around twenty representatives of national, regional and local patients' associations were brought together. Secondly, the research is supplemented with a content assessment of the Twitter activity of the most influential hospitals in Spain. The results reveal that the general public appreciate hospitals' communication potential through social media, although they are generally unaware of how it works. The group says that, apart from the lack of interaction, they find it hard to understand certain messages, and some publications give a biased picture. In order to improve communication, patients and relatives are demanding that their perspective be taken into consideration in the messages issued to enhance the quality of life and well-being of society.



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### ABOUT THE AUTHORS

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### PUBLIC INTEREST STATEMENT

This paper focuses on the analysis of aspects of hospital communication via social networks from the point of view of patients and their families in order to improve this activity and, therefore, the quality of life and social welfare of citizens. The opinions of people receiving specialized health care have been relevant in the study. There have been deficiencies found in the interaction between hospitals and citizens in social networks. Several proposals for improvement have been pointed out: a greater role of patients in the messages issued by the health entity; more understandable information and with less biased content according to the interests of health centers; and the work of professionals specialized in health communication and in social networks as responsible for this activity in the hospital; among other. In this way, citizens believe that a real dialogue would be achieved that would benefit the agents affected by hospital communication.

**Subjects: Social Sciences; Communication Studies; Health and Social Care; Medicine, Dentistry, Nursing & Allied Health**

**Keywords: health care communication; social networks; hospitals**

### 1. Introduction and theoretical fundamentals

Ever since information and communication technologies have been used in the health field (Tonja, 2014; Ventola, 2014), terms such as *e-patient* or *e-health* have been widely used. These expressions mainly relate to a fundamental change in the role that citizens play in the health care they receive (Prasad, 2013).

Patients and their relatives have more of a role in the health care process than before (Andersen, Medaglia, & Henriksen, 2012; Ricciardi, Mostashari, Murphy, Daniel, & Siminerio, 2013). Technological tools provide greater knowledge about various health issues or the ability to share experiences with other stakeholders in the area and interact more collaboratively and in a less hierarchical way (Prasad, 2013; Vance, Howe, & Dellavalle, 2009).

In that regard, Hawn (2009, p. 364) considered a decade ago how online social media –“blogs, tweets, wikis and social networks”– were accelerating and enriching communication, particularly in the health care arena, to make it even more effective than traditional care. Not only has that reality been endorsed with the passing of the years, but citizens have also witnessed a steady increase in online social media worldwide, including in the health field (Kass-Hout & Alhinnami, 2013; Moorhead et al., 2013).

However, the abundance (Bjerglund-Andersen & Söderqvist, 2012; Prasad, 2013) of various health care social media online does not necessarily mean that patients and carers assess it positively (Andersen et al., 2012). The Pew Research Center (2018) found that 69% of the 3,001 U.S. adult participants in a study did not consider the health information online to be beneficial, and 3% indicated that following online instruction, advice, or medical information had proven to be harmful. According to Prasad (2013, p. 494), “this should serve to remind us all that much of the health information on the Internet still originates from unregulated sources.”

Because the source of the information given is not well defined or is not mentioned and the messages are not clear or are not well referenced, members of the public question the reliability of the content disseminated on social media (Castilla, 2016; Pirraglia & Kravitz, 2012).

The medical community has noted (Eckler, Worsowicz, & Rayburn, 2010; Prasad, 2013) that the use of social media exposes medical care to other potential risks, such as the loss of the patient's confidentiality and privacy (Andersen et al., 2012; Chretien & Kind, 2013) when too many details of clinical cases are disclosed online, whether by the professional or by the patient (McKee, 2013); the poor interpretation that the general public may make of specialist comments on-line; or an excessive trust in social media when connecting with health professionals and the neglect of other traditional communication channels. Given this situation, says Eckler et al. (2010, p. 1048), “health care organizations must adopt clear policies regarding the use of social media and must educate physicians and staff about their expectations regarding what is appropriate and what is inappropriate.”

Health authorities' growing use of social media to provide medical information counters information issued by less reliable sources, as patients increasingly search for health information online (Antheunis, Tates, & Nieboer, 2013; Vance et al., 2009). A well-defined online communication management strategy by health care corporations involves the need to know the audiences and discussion spaces and to endow their citizen relations with “validity and reliability” (Moorhead et al., 2013, p. 2). That is even more the case in today's changing circumstances, where society

wishes not to be spoken to but to be heard, to participate appropriately and to have its needs met (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011).

Social media has become more prominent in recent years. According to authors such as Griffis et al. (2014) and Wang, McKee, Torbica, and Stuckler (2019), it will soon become the preferred communication tool for health care corporations. As regards hospital organization, the available studies are not conclusive with respect to the use of social media, even though they do suggest it is under-used in Europe and the United States (Griffis et al., 2014; Richter, Muhlestein, & Wilks, 2014; Van de Belt et al., 2013; Vanzetta et al., 2014) and used inefficiently worldwide (Yang et al., 2018; Zhang et al., 2018). However, there are hospitals with a highly visible profile and brand recognition on social media: the Mayo Clinic, the Cleveland Clinic and Mount Sinai Hospital, all of which are in the United States (Medina-Aguerrebera, 2018; Medina-Aguerrebera, Buil, & Heath, 2016).

In the case of Spain, Medina-Aguerrebera (2017, p. 226) points out that “the majority of Spanish hospitals consider social media to be an institutional communication tool.” However, the fact that more and more hospitals are present on social media does not mean that the communication is effective in other words, that the health care institutions’ goals for their social network communication are being met (Rando-Cueto, Paniagua-Rojano, & De-las-Heras-Pedrosa, 2016). Only half of hospitals use Facebook, Twitter, or YouTube as communication channels (Costa-Sánchez, Túñez-López, & Videla-Rodríguez, 2016); large and public hospitals have the greatest presence online (Bermúdez-Tamayo et al., 2013), and the quality of the websites is low (Calvo-Calvo, 2014). Despite widespread commitment to social media, hospitals continue to undercommunicate their corporate identity, with little variety in the range of social media used, along with the poor contents and applications, in the context of a limited professionalization of the corporate presence on social media (Medina-Aguerrebera, 2018).

Given the demonstrated impact of health social media on the general public (Fernández-Luque & Bau, 2015; Medina-Aguerrebera, 2018), there is a clear need for better understanding of the health system users and professional control of the social networks so those networks can act as real health care communication tools. For that reason (Medina-Aguerrebera, 2017), hospitals have been called on to further professionalize their corporate presence on various types of social media. Park, Rodgers, and Stemmler (2013) added that health care organizations need to adopt a more strategic approach aimed at optimizing their public exposure in the aforementioned channels.

If we focus on the patient and their relatives or carers, hospital social media can play a key role in improving pathological processes, along with the quality of life or well-being of the users. There are fully virtual health care platforms, such as the one described by Hawn (2009, p. 361): “HelloHealth,” through which social media is “reengineering the way doctors and patients interact.” Despite the lack of scientific articles that support the aforementioned benefits of social networks for citizens, research has shown, for example, a drop in unscheduled hospital readmissions among Facebook users (Glover et al., 2015) and an improvement in health education related to cardiovascular health through messages published on Twitter (Bosley et al., 2013).

Reducing social inequality, by opening the door for citizens to quick and easy, as well as free, access to scientific information (Kim & Lee, 2014), is among the advantages described in scientific literature on this new form of communication between hospitals and patients. On the other hand, interaction is fostered between professional and user, with both being jointly responsible for the treatment chosen (Lim, 2016), and healthy lifestyle habits are encouraged (Roblin, Houston, Allison, Joski, & Becker, 2009).

Medina-Aguerrebera (2017, p. 215) considers hospital social networks to be a “very powerful institutional communication tool to create reputable brands,” which involves improving relationships with the various audiences. The other side of the coin is content that members of the public can publish on social media in opposition to or with disregard for the institution and which can harm the hospital’s reputation (Lagu et al., 2016).

Social media is a tool for the health care community to improve quality and professional practice (Bernhardt, Alber, & Gold, 2014) at a low cost (Gomes & Coustasse, 2015). When communicating with user patients, social media allows real-time interaction and provides tools and spaces to access and exchange information, participation, and expression (Antheunis et al., 2013; Krowchuk, Lane, & Twaddell, 2010). The health professional networks are used to disseminate results, discussions, and networking, for outreach and research (Chretien & Kind, 2013), and for biomedical interaction (Grajales, Sheps, Ho, Novak-Lauscher, & Eysenbach, 2014; Grindrod, Forgione, Tsuyuki, Gavura, & Giustini, 2014; Von Muhlen & Ohno-Machado, 2012).

In any event, various authors support the idea of fostering a rapprochement between institution and society. Thus, they propose how health care corporations can use social media to forge a deeper emotional connection with the public and foster greater trust in the institutions if they are managed professionally (Kim, Kim, Kim, Kim, & Kang, 2008). The aforementioned communication channels would offer health care system users, in addition to the information services, a social support service (Myrick, Holton, Himelboim, & Love, 2015), as patients and relatives need emotional support, which they can find in social media (Chou, Hunt, Burke-Beckjord, Moser, & Hesse, 2009; Chung, 2013), by its very nature.

Finally, the very information published on social media is used by health researchers and health organization managers to measure aspects related to the care quality provided (Verhoef, Van de Belt, Engelen, Schoonhoven, & Kool, 2014), thanks to the assessment of the communication scenario established between (in this case) hospital and society. Nonetheless, aspects such as the lack of citizen representation in social networks or reading comprehension problems that can arise mean that, for the moment (Verhoef et al., 2014), the data gathered on social media to assess the care provided have to be compared and supplemented with that obtained by other, traditional methods.

The main objective of this study is to analyse the relationships between patients' associations and hospitals and the view they have of the communication strategies of hospital centres. Consequently, the research questions are:

RQ1: Do patient associations have a presence on social networks disseminating corroborative information to patients and family members?

RQ2: Can the oversaturation of health information on social networks generate a risk for society in health related issues?

RQ3: Are the contents shared in the official accounts of hospitals considered valuable by the patient associations?

## 2. Methodology

We conducted a systematic review of international scientific literature focused on the impact of social communication media and, in particular, of social media on patients and their relatives.

The carrying out of this study necessitates a mixed-method approach, the novelty of the analyzed field and the research questions raised require this type of method due to their complex nature (Creswell, 2013; Jick, 1979).

Firstly, a focus group meeting was held with representatives of patient and relative associations in order to focus the study on health system users, as citizens with knowledge of pathological processes and care received from health care institutions, given their first-person experience. The choice of this methodological technique was crucial in discovering the "attitudes and motivations" (Lunt & Livingstone, 1996, pp. 79–80) of the users and testing their understanding of hospital communication in social networks, along with collecting their opinions on improving it. In turn, the

participants were offered an opportunity to learn together by sharing their experiences (Lunt & Livingstone, 1996, p. 84).

Citizens' appraisal of the communication on social media initiated by health care institutions and their contribution to improving them can be used to outline proposals intended to improve the quality of life and well-being of society, despite the fact that those two concepts are heavily subjective in the case of the group being studied. As Fielding (2014, p. 1067) points out, "we are in a world where people die at home alone for lack of friends, family, or neighbours [...], but where a moment's loss of connectivity is an affront to our sense of well-being."

The staff of the Citizen Participation Unit at Malaga Regional University Hospital, one of the hospitals with the highest health care activity in Andalusia (Spain), helped to organize the focus group meeting.

Twenty-nine associations out of the ninety that Citizen Participation has registered in its database were invited by email to take part in the study. The selection was made based on the number of national, regional, and provincial members of each association. It involved groups that included other entities, such as the Malaga Accessible Development Group (an entity consisting of eighty associations and whose activity is related to various pathologies). The focus group meeting was conducted on hospital premises.

The digital community that follows the convened groups on social media totals nearly 27,000 people (26,578 as of 19 July 2018).

In addition to the representatives of the convened associations (Table 1), a Citizen Participation staff member attended the session, along with the people who ran and recorded it. The latter acted as external advisors in order to validate the perceptions of the person guiding the focus group and to make the session more objective.

All those attending the session signed a form indicating their consent to participate and permitting the publication of their full names, as well as their relationship with the entity they represented and their statements. The hospital and the authors kept a copy of this document. Likewise, the session was recorded with the verbal consent of the participants; the authors of this article have retained the audio recording. After the publication of this work, the results will be sent to the participants of the focus group, as well as to the Citizen Participation Unit and to the management team of the hospital center.

The face-to-face meeting helped to encourage participation, "disinhibition, perception of being on a level playing field, empathy, etc.," as Murgado-Armenteros, Torres-Ruiz, and Vega-Zamora (2012, p. 79) explained when describing the running of a focus group.

The session began with the moderator outlining results from previous research on hospital communication via social media, in order to establish the context in which the participants would act. The participants' input was then supplemented and broadened by having them answer a series of open questions to trigger free conversation, introduced by the moderator, following the "Anglo-Saxon approach" described by Murgado-Armenteros et al. (2012, p. 77).

The questions were divided into three distinct blocks:

- **Block I. Use of social media.** The aim of the questions raised in the first part of the session was to establish the general social media activity of the participants.
- **Block II. Hospital communication.** This block of questions sought to define the patients' communication activity with their designated hospital.

**Table 1. Source: prepared by the authors (July 2018)**

Association		Attendants On Behalf	Scope Of Action	SOCIAL NETWORKS	Digital Community (19/07/2018)
1	Agrupación de Desarrollo Málaga Accesible (involving 80 entities)	Toni Colomo Dolores J. Rubiales Alfredo de Pablos	Málaga	Facebook	177
2	Asociación Malagueña de Afectados de Polio y Postpolio (AMAPyP)	Mercedes González María Esther Martos Nieves González	Málaga	YouTube Facebook Twitter Instagram	38 815 793 0
3	Asociación Nacional de Personas Obesas (ASEPO)	Jesús Javier Díaz	Spain	Facebook Twitter LinkedIn Pinterest	4,896 480 500 20
4	Asociación Malagueña de Familiares y Afectados de Esclerosis Múltiple (AMFAEM)	Rafael T. Juan S. Inmaculada García	Málaga	Facebook Twitter	1895 147
5	Asociación Española Contra el Cáncer Málaga (AECC)	Alejo García	Málaga	Facebook Twitter Pinterest YouTube	4,543 2,045 802 5,781
6	Sembrando Futuro (asociación de discapacitados físicos gravemente afectados)	José Ramón López	Málaga	Facebook	154
7	Asociación Malagueña de Espina Bífida (AMAEB)	Rafael García	Málaga	Facebook	447
8	Bipolares de Andalucía Oriental (BAO)	Cristina Esteban Lourdes López Cabra	Andalucía	Facebook Twitter YouTube	344 222 35
9	Asociación para la Lucha Contra las Enfermedades del Riñón Málaga (ALCER)	Miguel Prego Josefa Gómez	Málaga	Twitter Facebook	703 1.741
<b>TOTAL:</b>					<b>26.578</b>

- **Block III. Hospital social media.** The last block of questions was the densest, both in terms of the number of questions, as the study focused on hospital communication through social media, and of the resulting answers.

A qualitative analysis was conducted of the shared answers from the focus group participations. This type of analysis was chosen because it offered the possibility of feedback on the ideas expressed by the participants and the enrichment of the speeches, following the conversations raised after the questions were put forward. A qualitative content analysis was carried out in order to categorize and classify the verbal and behavioral data of the attendees, as well as a qualitative analysis of the speech, taking into account the characteristics of the verbal and nonverbal language used in their conversation, through the participant observation of those who led the session.

To organize the information, open coding was used. A table was used in which the transcription of the statements was ordered according to the questions issued, divided into the three exposed blocks. The matching elements were searched for coinciding words or phrases, as well as those bodily expressions that indicated assent of the statements made in the group.

Secondly, a quantitative analysis was conducted of the Twitter accounts of the Spanish hospitals with the greatest impact on the Internet, given that Twitter is one of the most widely used social media. Thus, objective results were reviewed against the statements of patients and relatives. The Whotwi tool, an instrument allowing the selected Twitter accounts to be studied, was used.

The World Hospital Web Ranking was used in order to establish which hospitals had the largest presence online. That ranking is prepared by the *Consejo Superior de Investigaciones Científicas* (CSIC) (2015) according to size (number of pages recovered by Google, Yahoo, Live Search, and Exalead), visibility (number of single external links), and relevant archives or “rich files” of the website of each hospital, with a special emphasis on scientific production (citations on Google Scholar).

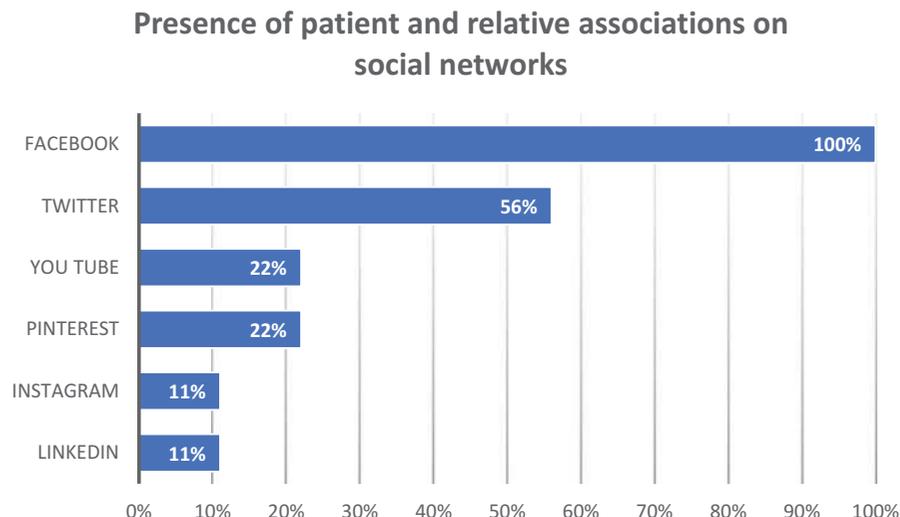
As the result of the search, using the [www.webometrics.info](http://www.webometrics.info) website, the leading Spanish hospitals with the greatest online impact are those indicated in Table 2.

The fifty tweets of each hospital (250 messages in all) that led to the greatest interaction -retweets, likes, or comments- from the start of their network activity were extracted from the Twitter accounts of the aforementioned hospitals using the Whotwi tool. The same screening sheets were applied to all of them, and data were extracted on the evolution of tweet interactivity;

**Table 2.** Source: [www.webometrics.info](http://www.webometrics.info) website and prepared by the authors (18 July 2018)

	Hospital	Size	Visibility	Rich Files	Google Scholar
1	Hospital Universitario Virgen de las Nieves	1340	2073	102	13
2	Parc de Salut Mar	959	1079	110	120
3	Complejo Hospitalario de Albacete	1090	1699	135	81
4	Hospital Sant Joan de Deu	1376	487	1074	271
5	Hospital Vall d'Hebron	358	1073	547	189

**Graph 1. Source: Prepared by the authors (2018).**



length of the messages; use of technical jargon; use of images or audio-visual elements; likes; retweets; comments; type of content; links; and links to other accounts and hashtags.

### 3. Results

The notable presence of the convened patient and relative associations on social media could be seen in the results obtained in the focus group, after analyzing the answers to the questions in Block I, on the use of social media. Only one of the participants stated that they did not have a social media account, even though they were aware of the “good communication work” that the entity they represented, Sembrando Futuro, was carrying out online -specifically, through its Facebook page-

As regards how often they are on social media, the patients stated that they participated on a daily basis, by either publishing their own content, sharing messages from other entities, or looking at information to see if it might be of interest to the members.

All the associations have a presence on Facebook, and the majority are on Twitter.

The associations stressed that the goals of their social media roles were to look for information on their pathological processes and on any aspects that might affect them, along with searching for news on services that might be of interest to patients and their relatives.

However, selecting content is no easy task for patients and their relatives due to the social media “information overload,” as the representatives of the Malaga Association of Polio and Post-Polio Suffers (AMAPyP) called it. The majority of delegates at the meeting agreed with this point. The members of the Malaga Accessible Development Group remarked that in addition to the “information overload,” there was the great dispersion of that information, and there was a risk that “very succinct information, discussed in little depth” is generated, which could lead to confusion in the recipients and a risk for society regarding health-related issues.

Concerning the analysis of Block II on hospital communication, the members of the Malaga Spina Bifida Association (AMAEB) stressed that corporations should prepare a “needs assessment” and clearly establish their communication goals before starting activity on social media, as “they sometimes arise from the mere fact of saying that we are cutting edge,” without any real demand existing. According to that group, there are numerous channels that in the end “fall into disuse as they are pointless.”

According to the attendees from the Malaga Association of Multiple Sclerosis Patients and Relatives (AMFAEM), the messages disseminated would be more useful if they were categorized and sent to the population “according to their most immediate interests and needs.”

Regarding hospital communication, in general, patients said that health care institutions should truly know their needs or show that through the aforementioned channels. According to the members of the National Association of Obese People (ASEPO), “there is no media that we are aware of that gives us immediate information and makes things easier.” Along with the statements of this group, which considers the hospital communication channels “inefficient,” the AMAPyP pointed out that as patients, “no information is received by any channel”; it does “not reach the users.”

The set of questions that provoked a deeper analysis and that responds more to the object of study is Block III, on hospital social media. One notable aspect of the block of questions on the hospital social network is that the majority of the participants were not aware of those channels. Five associations (AMAEB, BAO, AMAPyP, AMFAEM and Sembrando Futuro) stated that they did not know any hospital social media; one (ASEPO) specified that it was not aware of any public hospital social media but knew of a private one; two groups (Malaga Accessible Development Group and the AECC) confirmed that they were aware of the hospital social media activity, and the others made no comments in that regard.

During the focus group meeting, associations expressed curiosity about some hospital social media, and some representatives accessed them and then commented on their impressions.

When giving their input, patients and relatives differentiated between the social media content of private and public hospital centers. Thus the representatives from the Spanish Association Against Cancer (AECC) preferred to use the public hospital networks for information, as the messages in the private sector are more aimed at “selling services.” The representatives from AMAPyP added that “private health [centers] showcase their services to attract customers.”

The delegates from the Malaga Accessible Development Group corroborated the same premise, indicating that “a private health company is a business that, obviously, sells the product.” However, they pointed out that even though “the public sector also sells the product, as there is explicit political content” on social media, those channels “prioritize public services.”

Regarding bias in the content, the representatives of ASEPO stated that they believed that the content on hospital social media “is always about aspects favorable [to the institution].” According to the patients from the Association against Kidney Diseases (ALCER), “the information found on corporate social media is also biased,” and its aim is “always to report on the good.”

Nonetheless, the people who follow hospital social media stress the reliability of the content published. That aspect, aside from giving credibility to the hospital institutions, encourages interaction with other audiences, as the associations disseminate the messages issued by the institutions among their followers, acting as social media content amplifiers.

The members of AECC recognize that hospitals regard patient and relative groups as a way to connect hospitals and society. Yet this communication channel could be optimized even further if the comprehension problems were addressed that patients find on health center social media, as AMAPyP pointed out. According to that association, other associations, such as the Malaga Accessible Development Group and ASEPO, face reading comprehension barriers when it comes to social media messages.

The components of Malaga Accessible Development Group cited Twitter as an example. On Twitter, they said, there are too many abbreviations or acronyms making it difficult for the

information content to be correctly understood. This sometimes leads to “search Wikipedia and Google over half an hour for 140 characters to find the meaning of a tweet.”

Regarding the lack of reading comprehension, the representatives from ASEPO proposed prior training in media literacy aimed at patients and their relatives, for better interaction between the hospital and the general public. The representatives from the Malaga Development Group called for simplifying the expressions or including a link to a news item with detailed information on the given subject, yet without making Facebook or the Twitter account “seem more like a digital newspaper than social media.”

Despite the shortcomings that the associations found in hospital communication via social networks and the general ignorance about such networks that most of the delegates admitted to, all the delegates were positive about the potential of the hospital social media as channels that “have to be harnessed” (AECC), provided that they are managed appropriately, according to social needs. For complaints and suggestions alike, the users of health care systems believe that there has to be more communication, not only to improve the systems’ quality and well-being, and therefore that of society, but also their very evolution.

The possibility of “reaching more people” through networks than through other communication channels was welcomed by groups such as ASEPO, provided there is a real interaction between hospital and user, because “if there is no interaction, it does not work or its mission is not the correct one.” The attendees from ALCER approved of “universal and general networks that can provide your neighbor or someone from South America with information.” According to these representatives, social media that interacts “more than necessary is essential to reach the general public, provided the information is accurate, rigorous and reliable [...] and the content is always prepared with a focus on helping the patient and relatives.”

Regarding the proposals that the representatives of associations stressed in their input, they all agreed on the need for citizens to interact with and to be listened to by the institutions. Therefore, training patients in social media communication is crucial. The health care institution must adapt its messages to society’s level of knowledge on the topics being disseminated, either on the health sector or the activity of communication itself.

The professionalization of hospital communication, particularly through social networks, is fundamental, as AMAPyP, ASEPO, ALCER, AECC, and the Malaga Accessible Development Group expressly stressed and the other representatives agreed. They said that the person who administers the content of hospital social media must be a professional with extensive knowledge both of communication and of other health aspects and of the health management system itself, “who knows what they are talking about” (AECC). Furthermore, that person has to have sufficient authority to answer using the same channel immediately or quickly and efficiently refer to the professional empowered to do so and to work according to an established social media communication protocol.

With respect to the results obtained in the quantitative screening sheets of the Twitter counts of Spanish hospitals, it should be noted that the messages with higher interaction rates are from recent years. Even though it is true that hospital accounts are gaining increasing numbers of followers, the growing number of citizens in social networks is not negligible, as the patients pointed out.

However, even though communications with a greater degree of interaction have been chosen, that is not significant. Thus when the number of likes, retweets, or published comments is analyzed as an indicator of dialogue between the hospital and the general public, in the best of cases, the total barely exceeds 1% of the followers of hospital Twitter accounts. Furthermore, hospital centers do not respond, at least publicly, to negative comments.

Regarding the use of jargon in messages, less than half of the messages analyzed include technical terms or labels whose meaning may be hard to understand for a recipient who is not an expert in health or socio-health aspects. In any event, tweets have been found with terms that the general public would be unlikely to understand. In the case of Vall d'Hebron Hospital and Albacete University Hospital, 36% and 44% of the messages, respectively, contained jargon, an aspect criticized by the associations.

Images or videos are in practically all the messages where there is the greatest interaction. Icons are another example of this audiovisual communication and are used, particularly at San Joan de Deu Hospital, in 32% of messages, indicating an attempt to reach the general public. In the case of both images and videos, people -professionals, patients, and relative alike- are at the forefront and are the human face of the health care offered.

Regarding the content of the messages published on Twitter, over half of them (57.2%) involved disseminating the hospital's news, such as events held, breakthroughs in research, and acts to celebrate a World Day. Special mention should be made of the percentage of messages thanking or recognizing a group (professionals, patients, associations, etc.) (28.4%). The other texts analyzed cover fund-raising (16.4% of the analyzed messages issued by the Catalan hospitals Parc de Salut Mar, San Joan de Deu, and Vall d'Hebron); health prevention and promotion (10.9%); messages that echo news published by other media (6%); general information on health (4.8%), service information and information on the activity of other entities (1.6% each).

#### **4. Conclusions**

With regard to the aims, this study explains the presence of the patients' organizations on social media and the negative consequences that oversaturation of information about health through this channel may have on the audience, without forgetting what these groups think about the official accounts of the hospital.

#### **RQ1 "Do patient associations have presence on social networks disseminating corroborative information to patients and family members?"**

According to Griffis et al. (2014), citizen participation in social networks is increasing. Members of the associations participating in the study, who represent a digital community of about 27,000 users in 2019, have highlighted their daily activity on social networks (mainly, on Facebook and Twitter). Organizations act as issuers of information and interact in social networks, in addition to looking in this scenario for news related to their pathological process or other aspects that affect their health.

However, the citizens taking part in the focus group, as representatives of patient and family associations, said that they felt a lack of attention from health care institutions as regards communication. In their own words, they "do not feel heard."

The statements made by the associations during the group session contradicted the statements of intent with which health care institutions open a corporate account on social media, whose objectives include fostering active listening of the patients' needs and offering better interaction with the general public. Thus, given the social demand for hospitals to respond to the messages published through those channels, the action of the institution fails to meet that request. This is even more the case for negative comments, when the response by the hospitals analyzed is non-existent, at least on social media.

#### **RQ2 "Can the oversaturation of health information in social networks generate a risk for society in health related issues?"**

According with Wang et al. (2019) although social networks provide a challenge to engage in ways that are beneficial also allow some risks to flourish.

Patient associations have insisted on the difficulty in accessing certain health content disseminated through social networks, both because of the enormous diversity of existing issuers and the difficulty in understanding certain contents from specialized health sources. This lack of understanding is largely caused by the use of messages that were too complex for society due to the jargon used or their lack of development and due to a fear of false information.

The risks to citizens arising are centered on the study of the lack of interaction between the agents involved in the use of a highly specialized language; the damages that an erroneous interpretation of the messages received in health matters may suppose; the loss of confidentiality and privacy of users by offering too much personal data; as well as go to sources of dubious credibility.

### **RQ3 Are the contents shared in the official accounts of the hospitals considered valuable by the patient associations?**

In spite of the majority of consulted users expressed their lack of knowledge of corporate accounts, in addition to difficulty in accessing those types of communication channels, all the members of the associations recognized the potential of the official accounts of the hospitals. They think it is positive that hospital institutions report on health. However, they consider that the contents must be reported from different points of view, instead of being reported from an institutional perspective. Hospitals should consider their audience -patients and their organizations- interest more and in a style focusing on preventive health communication, for example.

Messages for information purposes, providing news on the hospital and exposing fundamentally positive content, are the most common type of messages in the hospital Twitter accounts analyzed here. They reinforce the standpoint of the patients and relatives, who call for a more diversified communication that places citizens at the core of the health care system.

The images, videos, and icons in the publications analyzed in the study not only provide information content but also help the recipients understand the messages. They also encourage the reading of the messages, as a step toward possible interaction between the different stakeholders in the communication process.

In this way, the research showed the shortcomings of hospital communication via social media and identified improvement strategies to help individuals achieve a better quality of life and well-being.

Some of the proposals made by the patients and relatives to improve network communication activity were the following: offering information that was less biased in favour of the health centres' private and public interests; making hospital corporate social media more understandable; and encouraging the figure of the expert communication professional in social networks and in health care in hospital institutions.

As the representatives of the consulted associations also said, if they had a greater presence in corporate social media, providing their perspective on pathological processes or health care received, aspects related to improving citizens' quality of life and social well-being would be boosted, benefiting the health care system.

Therefore, as Kim et al. (2008) and Antonacci, Fronzetti Colladon, Stefanini, and Gloor (2017) maintain, users are demanding more of a connection between institution and society in order for the relationship via social media to be truly effective. Members of the public have expressed their interest in playing a key part in hospital communication, thus achieving real dialogue that will benefit both parties.

In conclusion, according to Macnamara (2016), patients and organizations want hospitals to recognize them to interact regarding about health; they must be identified as an important voice in some topics -because they can recount their experiences-; and they would have an answer in an appropriated way after consideration has been given (Antonacci et al., 2017; Lundsteen, 1979; Purdy & Borisoff, 1997) as conversation and the engagement is a pending subject in digital communication and on social media.

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#### Correction

This article has been republished with minor changes. These changes do not impact the academic content of the article.

#### References

Andersen, K. N., Medaglia, R., & Henriksen, H. Z. (2012). Social media in public health care: Impact domain propositions. *Government Information Quarterly*, 29, 462–469. doi:10.1016/j.giq.2012.07.004

Antheunis, M. L., Tate, K., & Nieboer, T. E. (2013). Patients' and health professionals' use of social media in health care: Motives, barriers and expectations. *Patient Education and Counseling*, 92, 426–431. doi:10.1016/j.pec.2013.06.020

Antonacci, G., Fronzetti Colladon, A., Stefanini, A., & Gloor, P. (2017). It is rotating leaders who build the swarm: Social network determinants of growth for health-care virtual communities of practice. *Journal of Knowledge Management*, 21, 1218–1239. doi:10.1108/jkm-11-2016-0504

Bermúdez-Tamayo, C., Alba-Ruiz, R., Jiménez-Pernett, J., García-Gutiérrez, J. F., Traver-Salcedo, V., & Yubraham-Sánchez, D. (2013). Use of social media by Spanish hospitals: Perceptions, difficulties, and success factors. *Telemedicine and e-Health*, 19, 137–145. doi:10.1089/tmj.2012.006

Bernhardt, J. M., Alber, J., & Gold, R. S. (2014). A social media primer for professionals. *Health Promotion Practice*, 15, 168–172. doi:10.1177/1524839913517235

Bjerglund-Andersen, N., & Söderqvist, T. (2012). *Social media and public health research*. University of Copenhagen, Faculty of Science. Retrieved from <https://www.bjerglund.files.wordpress.com/2012/11/final-social-media-and-public-health-research1.pdf>

Bosley, J. C., Zhao, N. W., Hill, S., Shofer, F. S., Asch, D. A., Becker, L. B., & Merchant, R. M. (2013). Decoding twitter: Surveillance and trends for cardiac arrest and resuscitation communication. *Resuscitation*, 84, 206–212. doi:10.1016/j.resuscitation.2012.10.017

Calvo-Calvo, M. A. (2014). Calidad y características de los sitios web de los hospitales españoles de gran tamaño. *Revista Española de Documentación Científica*, 37(1), e032. doi:10.3989/redc.2014.1.1049

Castilla, G. (2016). La comunicación en salud desde el punto de vista de una sociedad médica. *Revista Española de Comunicación y Salud*, 7(Sup1). doi:10.20318/recs.2016.3131

Chou, W. S., Hunt, Y., Burke-Beckjord, E., Moser, R. P., & Hesse, B. W. (2009). Social media use in United States: Implications for health communication. *Journal of Medical Internet Research*, 11, e48. doi:10.2196/jmir.1249

Chretien, K. C., & Kind, T. (2013). Social media and clinical care: Ethical, professional, and social implications. *Circulation*, 127, 1413–1421. doi:10.1161/circulationaha.112.128017

Chung, J. E. (2013). Social networking in online support groups for health: How online social networking benefits patients. *Journal of Health Communication*, 19, 639–659. doi:10.1080/10810730.2012.757396

Consejo Superior de Investigaciones Científicas de España [CSIC] (2015). Ranking Mundial de Hospitales 2015. Retrieved from <http://hospitals.webometrics.info/es/metodologia>

Costa-Sánchez, C., Túnuez-López, M., & Videla-Rodríguez, J. J. (2016). Hospitales españoles en la web social. Gestión de Facebook y Twitter por el Hospital Sant Joan de Déu (Barcelona). *Revista Latina de Comunicación Social*, 71, 1108–1130. doi:10.4185/lracs-2016-1137

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. London, UK: Sage publications.

Eckler, P., Worsowicz, G., & Rayburn, J. W. (2010). Social MEDIA AND HEALTH Care: An overview. *PM&R*, 2, 1046–1050. doi:10.1016/j.pmrj.2010.09.005

- Fernández-Luque, L., & Bau, T. (2015). Health and social media: Perfect storm of information. *Healthcare Informatics Research*, 21, 67. doi:10.4258/hir.2015.21.2.67
- Fielding, N. G. (2014). Qualitative research and our digital futures. *Qualitative Inquiry*, 20, 1064–1073. doi:10.1177/1077800414545237
- Glover, M., Khalilzadeh, O., Choy, G., Prabhakar, A. M., Pandharipande, P. V., & Gazelle, G. S. (2015). Hospital evaluations by social media: A comparative analysis of facebook ratings among performance outliers. *Journal of General Internal Medicine*, 30, 1440–1446. doi:10.1007/s11606-015-3236-3
- Gomes, C., & Coustasse, A. (2015). Tweeting and treating how hospitals use twitter to improve care. *Health Care Manager*, 34, 213–214. doi:10.1097/hcm.0000000000000063
- Grajales, F. J., Sheps, S., Ho, K., Novak-Lauscher, H., & Eysenbach, G. (2014). Social media: A review and tutorial of applications in medicine and health care. *Journal of Medical Internet Research*, 16, e13. doi:10.2196/jmir.2912
- Griffis, H. M., Kilaru, A. S., Werner, R. M., Asch, D. A., Hershey, J. C., Hill, S., ... Merchant, R. M. (2014). Use of social media across us hospitals: Descriptive analysis of adoption and utilization. *Journal of Medical Internet Research*, 16, e264. doi:10.2196/jmir.3758
- Grindrod, K., Forgiione, A., Tsuyuki, R. T., Gavura, S., & Giustini, D. (2014). Pharmacy 2.0: A scoping review of social media use in pharmacy. *Research in Social and Administrative Pharmacy*, 10(1), 256–270. doi:10.1016/j.sapharm.2013.05.004
- Hawn, C. (2009). Take two aspirin and tweet me in the morning: How Twitter, Facebook, and other social media are reshaping health care. *Health Affairs*, 28, 361–368. doi:10.1377/hlthaff.28.2.361
- Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24, 602–611. doi:10.2307/2392366
- Kass-Hout, T., & Alhinami, H. (2013). Social media in public health. *British Medical Bulletin*, 108, 5–24. doi:10.1093/bmb/ldt028
- Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons*, 54, 241–251. doi:10.1016/j.bushor.2011.01.005
- Kim, J.-N., & Lee, S. (2014). Communication and Cybercoping: Coping with chronic illness through communicative action in online support networks. *Journal of Health Communication*, 19, 775–794. doi:10.1080/10810730.2013.864724
- Kim, K. H., Kim, K. S., Kim, D. Y., Kim, J. H., & Kang, S. H. (2008). Brand equity in hospital marketing. *Journal of Business Research*, 61, 75–82. doi:10.1016/j.jbusres.2006.05.010
- Krowchuk, H. V., Lane, S. H., & Twaddell, J. W. (2010). Should social media be used to communicate with patients? *MCN the American Journal of Maternal/Child Nursing*, 35, 6–7. doi:10.1097/01.nmc.0000366802.88540.54
- Lagu, T., Goff, S. L., Craft, B., Calcasola, S., Benjamin, E. M. L., Priya, A., & Lindenauer, P. K. (2016). Can social media be used as a hospital quality improvement tool? *Journal of Hospital Medicine*, 11(1), 52–55. doi:10.1002/jhm.2486
- Lim, W. M. (2016). Social media in medical and health care: Opportunities and challenges. *Marketing Intelligence & Planning*, 34, 964–976. doi:10.1108/mip-06-2015-0120
- Lundsteen, S. (1979). *Listening: Its impact on language and the other language arts*. Urbana, IL: ERIC Clearing House on Reading and Communication Skills.
- Lunt, P., & Livingstone, S. (1996). Rethinking the focus group in media and communications research. *Journal of Communication*, 46, 79–98. doi:10.1111/j.1460-2466.1996.tb01475.x
- Macnamara, J. (2016). Organizational listening: Addressing a major gap in public relations theory and practice. *Journal of Public Relations Research*, Vol. 28, No., 3–4, 146–169. doi:10.1080/1062726X.2016.1228064
- McKee, R. (2013). Ethical issues in using social media for health and health care research. *Health Policy*, 110, 298–301. doi:10.1016/j.healthpol.2013.02.006
- Medina-Aguerreberre, P. (2017). El rol de las redes sociales en la comunicación de marca de los hospitales españoles [The impact of social media in branding communication of Spanish hospitals]. *adComunica. Revista Científica de Estrategias, Tendencias e Innovación en Comunicación*, 15, 215–233. doi:10.6035/2174-0992.2018.15.11
- Medina-Aguerreberre, P. (2018). La gestión de la reputación online de las marcas hospitalarias: Una propuesta de modelo. *Zer*, 22, 53–68. doi:10.1387/zer.17908
- Medina-Aguerreberre, P., Buil, P., & Heath, R. L. (2016). Establishing and demonstrating US hospital brands through Facebook. *Observatorio Journal*, 10, 20–40. doi:10.15847/obsobs1032016912
- Moorhead, S. A., Hazlett, D. E., Harrison, L., Carroll, J. K., Irwin, A., & Hoving, C. (2013). A new dimension of health care: Systematic review of the uses, benefits, and limitations of social media for health communication. *Journal of Medical Internet Research*, 15, e85. doi:10.2196/jmir.1933
- Murgado-Armenteros, E. M., Torres-Ruiz, F. J., & Vega-Zamora, M. (2012). Differences between online and face to face focus groups, viewed through two approaches. *Journal of Theoretical and Applied Electronic Commerce Research*, 7, 15–16. doi:10.4067/s0718-18762012000200008
- Myrick, J. G., Holton, A. E., Himelboim, I., & Love, B. (2015). #Stupidcancer: Exploring a typology of social support and the role of emotional expression in a social media community. *Health Communication*, 31, 596–605. doi:10.1080/10410236.2014.981664
- Park, H., Rodgers, S., & Stemmler, J. (2013). Analyzing health organizations' use of twitter for promoting health literacy. *Journal of Health Communication*, 18, 410–425. doi:10.1080/10810730.2012.727956
- PEW Research Center. (2018). Retrieved July 8. Retrieved from <http://pewinternet.org/Reports/2010/Older-Adults-and-Social-Media/Report.aspx>
- Pirraglia, P. A., & Kravitz, R. L. (2012). Social media: New opportunities, new ethical concerns. *Journal of General Internal Medicine*, 28, 165–166. doi:10.1007/s11606-012-2288-x
- Prasad, B. (2013). Social media, health care, and social networking. *Gastrointestinal Endoscopy*, 77, 492–495. doi:10.1016/j.gie.2012.10.026
- Purdy, M., & Borisoff, D. (1997). *Listening in everyday life: A personal and professional approach* (2nd ed.). Lanham, MA: University of America Press.
- Rando-Cueto, D., Paniagua-Rojano, F. J., & De-las-Heras-Pedrosa, C. (2016). Influence factors on the success of hospital communication via social networks. *Revista Latina de Comunicación Social*, 71(1), 170–1186. doi:10.4185/rlds-2016-1140en
- Ricciardi, L., Mostashari, F., Murphy, J., Daniel, J. G., & Siminerio, E. P. (2013). A national action plan to

- support consumer engagement via E-health. *Health Affairs*, 32, 376–384. doi:10.1377/hlthaff.2012.1216
- Richter, J., Muhlestein, D. B., & Wilks, C. (2014). Social media: How hospitals use it, and opportunities for future use. *Journal of Healthcare Management*, 59, 447–461. doi:10.1097/00115514-201411000-00011
- Roblin, D. W., Houston, T. K., Allison, J. J., Joski, P. J., & Becker, E. R. (2009). Disparities in use of a personal health record in a managed care organization. *Journal of the American Medical Informatics Association*, 16, 683–689. doi:10.1197/jamia.m3169
- Tonia, T. (2014). Social media in public health. *Is It Used and Is It Useful? International Journal of Public Health*, 59, 889–891. doi:10.1007/s00038-014-0615-1
- Van de Belt, T. H., Engelen, L. J., Berben, S. A., Teerenstra, S., Samsom, M., & Schoonhoven, L. (2013). Internet and social media for health-related information and communication in health care: Preferences of the Dutch general population. *Journal of Medical Internet Research*, 15, e220. doi:10.2196/jmir.2607
- Vance, K., Howe, W., & Dellavalle, R. P. (2009). Social internet sites as a source of public health information. *Dermatologic Clinics*, 27, 133–136. doi:10.1016/j.det.2008.11.010
- Vanzetta, M., Vellome, E., Dal Molin, A., Rocco, G., De Marinis, G., & Rosaria, A. (2014). Communication with the public in the health-care system: A descriptive study of the use of social media in Local Health Authorities and public hospitals in Italy. *Annali dell'Istituto Superior Di Sanità*, 50, 163–170. doi:10.4415/ANN\_14\_02\_10
- Ventola, C. L. (2014). Social media and health care professionals: Benefits, risks, and best practices. *Pharmacy and Therapeutics*, 39, 491–499. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4103576/>
- Verhoef, L. M., Van de Belt, T. H., Engelen, L. J., Schoonhoven, L., & Kool, R. B. (2014). Social media and rating sites as tools to understanding quality of care: A scoping review. *Journal of Medical Internet Research*, 16, e56. doi:10.2196/jmir.3024
- Von Muhlen, M., & Ohno-Machado, L. (2012). Reviewing social media use by clinicians. *Journal of the American Medical Informatics Association*, 19, 777–781. doi:10.1136/amiajnl-2012-000990
- Wang, Y., McKee, M., Torbica, A., & Stuckler, D. (2019). Systematic literature review on the spread of health-related misinformation on social media. *Social Science & Medicine*, 240, 112552. doi:10.1016/j.socscimed.2019.112552
- Yang, P.-C., Lee, W. C., Liu, H. Y., Shih, M. J., Chen, T. J., Chou, L. F., & Hwang, S.-J. (2018). Use of Facebook by hospitals in Taiwan: A nationwide survey. *International Journal of Environmental Research and Public Health*, 15, 1188. doi:10.3390/ijerph15061188
- Zhang, W., Deng, Z., Evans, R., Xiang, F., Ye, Q., & Zeng, R. (2018). Social media landscape of the tertiary referral hospitals in China: Observational descriptive study. *Journal of Medical Internet Research*, 20, e249. doi:10.2196/jmir.9607



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