

Radiologists' Usage of Social Media: Results of the RANSOM Survey

Erik R. Ranschaert¹ · Peter M. A. Van Ooijen² · Geraldine B. McGinty³ · Paul M Parizel⁴

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Abstract The growing use of social media is transforming the way health care professionals (HCPs) are communicating. In this changing environment, it could be useful to outline the usage of social media by radiologists in all its facets and on an international level. The main objective of the RANSOM survey was to investigate how radiologists are using social media and what is their attitude towards them. The second goal was to discern differences in tendencies among American and European radiologists. An international survey was launched on SurveyMonkey (<https://www.surveymonkey.com>) asking questions about the platforms they prefer, about the advantages, disadvantages, and risks, and about the main incentives and barriers to use social media. A total of 477 radiologists participated in the survey, of which 277 from Europe and 127 from North America. The results show that 85 % of all survey participants are using social media, mostly for a mixture of private and professional reasons. Facebook is the most popular platform for general purposes, whereas LinkedIn and Twitter are more popular for professional usage. The most important reason for not using social media is an unwillingness to mix private and professional matters.

Eighty-two percent of all participants are aware of the educational opportunities offered by social media. The survey results underline the need to increase radiologists' skills in using social media efficiently and safely. There is also a need to create clear guidelines regarding the online and social media presence of radiologists to maximize the potential benefits of engaging with social media.

Keywords Radiology · Internet · Social media · Twitter messaging

Introduction

Social media is a broad term for various Internet-based tools allowing their users to generate and share content and to communicate online [1, 2]. They are also defined as “a group of Internet-based applications that are built on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content” [3]. A surge of social networking tools has become available in the past few years and their popularity has grown significantly [4]. This evolution has transformed the traditional asynchronous conversation via e-mail and older online forums into an open, two-way interactive dialogue. The information exchanged in such dialogue may also include audio, photo, or video files [2, 5]. One of the effects of this new type of communication is the blurring of the traditional boundaries between private and public, between home and work, and between being a consumer and producer of information [5]. In recent years, the use of social media by health care professionals (HCPs) and hospitals has grown significantly, which is also transforming the way HCPs are communicating [6–8]. In a professional context, most HCPs prefer those platforms where they can follow the latest news in medicine, listen to experts, consult

✉ Erik R. Ranschaert
e.ranschaert@jzbz.nl; erik.ranschaert@gmail.com

¹ Department of Radiology, Jeroen Bosch Ziekenhuis, Henri Dunantstraat 1, 5223 GZ 's-Hertogenbosch, The Netherlands
² Department of Radiology, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands
³ Department of Radiology, NewYork-Presbyterian Hospital/Weill Cornell Medical Center, New York, NY, USA
⁴ Department of Radiology, Antwerp University Hospital and University of Antwerp, Wilrijkstraat 10, Edegem B-2650, Belgium

colleagues, and communicate with colleagues regarding their profession and medical cases. Only a minority uses social media to communicate directly with patients [7]. A recent large-scale survey showed however that more than 90 % of physicians use social media for personal activities and that 65 % uses these sites for professional reasons [7]. Most surveys about the usage of social media by HCPs however do not differentiate between physician time spent using social media for personal and for practice purposes [9]. No research has been published yet outlining the usage of social media by radiologists in all its facets and on an international level. In this article, the results are presented of a survey that was created to find answers to questions regarding the number of radiologists using social media, the frequency and reasons for using them, the types of platforms they prefer, the main advantages, disadvantage and risks of using social media, and the future role of social media for radiologists. The second goal was to evaluate any differences in tendency regarding the usage of social media by US-based and European-based radiologists.

Materials and Methods

Study Design

The RANSOM survey (Radiologists ANd social Media) is an online survey conducted by a doctoral student of the University of Antwerp in collaboration with the European Society of Medical Imaging Informatics (EuSoMII). Data collection took place between March 29th and May 12th, 2015. The European Society of Radiology (ESR), the Society for Imaging Informatics in Medicine (SIIM), and the American College of Radiology (ACR) supported the survey for recruitment of participants. No patient health data were used in this survey and participation was on a voluntary basis. Participants were informed that their combined responses would be used for a scientific publication. No external funding was used. The survey was created using SurveyMonkey (SM) (SurveyMonkey, Portland, OR). The target subjects for the survey were radiologists and radiology residents, without geographic limitations for participation. Sex and age of the responders were not recorded. An 11-section survey was developed with 21 multiple-choice questions and 4 open questions. The open questions did not allow the selection of a predefined answer and needed input from the participant. In two questions, users were asked to rank the answers by choosing a position number for each answer, number 1 being the answer with the highest importance or weight. From the answers, an average ranking score (RS) was calculated, the highest score corresponding with the answer that was most preferred overall.

Recruitment

Participants were recruited via e-mail invitations containing Web Links to the survey. Most e-mail addresses came from the corresponding author's professional contact list and all invitees were encouraged to forward invitations within their own network. In addition, newsletters and postings on Facebook and Twitter were used to invite radiologists to participate, including a hyperlink to the survey. SM statistical tools were used for analysis of the responses. For the open answers (qualitative data), both an automated and a manual text analysis were performed. The automated analysis was based upon text processing and categorization of answers based on the names of the social media that were provided in the replies. In the manual part, answers were identified, ordered, counted, compared, and analyzed using the SM coding technique. Online filtering and segmentation techniques were used for selective analysis based on geographic data.

Results

Five hundred sixteen responses were collected, of which 477 were submitted by radiologists and radiologists in training. Table 1 gives an overview of the demographic distribution and main activities of all participants. Two hundred seventy-seven participants came from Europe and 127 from North America (USA 121, Canada 6).

Eighty-five percent of all participants reported using social media, with the US-based radiologists surpassing their European colleagues (89 vs 80 %). Primary work environment does not significantly influence the usage of social media. Most participants (76 %) are using social media for both private and professional purposes, 15 % use them solely for private purposes and 10 % solely for professional purposes. Seventy-six percent of all users have the opinion that social media are popular for private purposes, whereas only 34 %

Table 1 Participant demographics ($n=477$)

| Country | <i>n</i> (%) | Type of practice | | |
|---------------|--------------|---------------------|---------------------|----------------------|
| | | AH ^a (%) | PH ^b (%) | PRP ^c (%) |
| Europe | 277 (58) | 33 | 46 | 21 |
| North-America | 127 (27) | 78 | 6 | 16 |
| Asia | 38 (8) | 32 | 42 | 26 |
| South-America | 21 (4) | 14 | 24 | 62 |
| Africa | 14 (3) | 43 | 36 | 21 |
| Total | 477 (100) | 44 | 34 | 22 |

^a AH = Academic Hospital

^b PH = Public Hospital

^c PRP = Private Radiology Practice or Private Hospital

says they are popular for professional usage, which means that private usage of social media is preferred above professional usage. When comparing the popularity of social media between radiologists located in the USA and Europe, the results are similar for both private (USA 94 %, Europe 91 %) and professional (USA 41 %, Europe 35 %) usage of social media. The main stated reason for not using social media professionally is an unwillingness to mix personal and professional matters (RS 5,4), followed by lack of time (RS 5,2) and reluctance to have direct contact with patients through social media (RS 4,5). Of the non-users, 39 % stated that they do not plan to use social media in the future and an equal percentage is still in doubt about this.

Almost half of all respondents use social media more than once a day (49 %), 25 % uses them only once a day and 15 % a few times a week. Table 2 shows the ranking of social media channels for general purposes (i.e., not discerning between private and professional usage). The participants were asked to select the platform they would prefer to use if only one platform was available. Facebook is by far the most popular platform (51 %), followed by LinkedIn and Twitter. Among US-radiologists, Twitter takes second place, whereas for most Europeans, LinkedIn was chosen second.

Table 3 displays the answers to the open questions about preferred platforms for general and professional purposes. The participants had to fill-in the names of their three most favorite platforms, choice number 1 being the most preferred one. The percentages are calculated by comparing the number of participants with the same preference to the total number of participants within each (geographic) group. For general purposes, Facebook was mentioned most frequently as first (48 %). Many participants (13 %) also referred to Youtube and Instagram, whereas Google+ was only mentioned by 5 % of participants.

In a professional context, most participants opt for LinkedIn as their first choice and Facebook as their second

Table 2 The most popular social media for general purposes for the total group of participants, for participants from Europe, and for participants from the USA. The percentages are calculated for each group separately. The platforms most frequently mentioned in the “other” option were WhatsApp, Instagram, and ResearchGate (in order of preference). Xing is a business network that is mainly used in German speaking countries

| Platform | Europe (n) % | USA (n) % | Total (n) % |
|----------|--------------|-----------|-------------|
| Facebook | (127) 46 | (62) 49 | (243) 51 |
| LinkedIn | (91) 33 | (20) 16 | (119) 25 |
| Twitter | (44) 16 | (34) 27 | (86) 18 |
| YouTube | (39) 14 | (8) 6 | (57) 12 |
| Google+ | (22) 8 | (5) 4 | (38) 8 |
| Other | (17) 6 | (5) 4 | (29) 6 |
| Xing | (3) 1 | (0) 0 | (3) 1 |

Table 3 Favorite social media platforms

| For general purposes | | | | |
|---------------------------|----------|------------|---------|-----------|
| Choice | Name | Europe (%) | USA (%) | Total (%) |
| 1 | Facebook | 42 | 46 | 48 |
| 2 | LinkedIn | 26 | 30 | 25 |
| 3 | Twitter | 25 | 18 | 21 |
| For professional purposes | | | | |
| Choice | Name | Europe (%) | USA (%) | Total (%) |
| 1 | LinkedIn | 56 | 32 | 45 |
| 2 | Facebook | 32 | 15 | 21 |
| 3 | Twitter | 24 | 47 | 19 |

choice. For the USA-based radiologists, Twitter is the platform of choice for professional use with LinkedIn coming in second. For most Europeans, however, LinkedIn is their first choice, followed by Facebook. US participants (19 %) also mention Doximity in their second and third choices; YouTube obtained a 12 % score in the list of third choice platforms for professional usage.

Table 4 shows the reasons for radiologists to use social media professionally. The percentages displayed are calculated from the number of participants who chose each answer in each group. The main stated reason is the ability to stay informed about the latest news and developments in radiology and the second, the ability to communicate with other colleagues about radiology-related topics. For the US-based participants, the possibility of increasing their influence and promoting ideas is the third most important stated reason for using social media, together with making radiology more visible to patients (50 %). European participants consider the possibility of being able to share and discuss interesting cases relatively more important. Also, the ability to market radiology services and get better contact with both clinicians and patients are stronger incentives for USA-based than for European participants. Informing patients about the examinations they will undergo or obtaining their feedback are overall relatively less important reasons to use social media. A relatively small group of participants is using social media for job applications.

Table 5 shows what radiologists perceive to be the risks or disadvantages of social media. Most participants indicate that they are concerned about the lack of sufficient legislation, guidelines, and policies about using social media in healthcare. In this context, they are also concerned about breaching the privacy of both radiologists and patients.

Eighty-two percent of participants are using social media for educational purposes. The most popular interactive platform is the Radiopaedia Facebook page. Most European participants mentioned the myESR Facebook page as their second choice and Twitter as their third choice. Ten percent of US-based radiologists co-ranked Twitter, CTisUS on Facebook,

Table 4 Reasons for radiologists to use social media professionally

| | | Total % | Europe % | USA % |
|----|--------------------------------------------------------------------------------------------|---------|----------|-------|
| 1 | To stay informed about the latest news and developments in radiology | 65 | 64 | 63 |
| 2 | To communicate with colleagues about radiology-related topics (national and international) | 49 | 35 | 66 |
| 3 | To share and discuss interesting or difficult cases/images with colleagues | 34 | 32 | 21 |
| 4 | To increase my influence and promote my ideas/vision among radiologists | 29 | 24 | 50 |
| 5 | To make our profession more visible for patients | 27 | 19 | 50 |
| 6 | To make my expertise and knowledge available for teaching purposes | 25 | 22 | 27 |
| 7 | To market our team and services | 19 | 16 | 31 |
| 8 | To become more “social” with both patients and clinicians | 18 | 16 | 29 |
| 9 | To enable patients to communicate with radiologists | 17 | 16 | 26 |
| 10 | To inform patients about the examinations they will undergo | 7 | 5 | 10 |
| 11 | To get feedback from patients (both positive and negative) | 6 | 6 | 6 |
| 12 | To discuss radiological images with patients | 4 | 3 | 3 |
| 13 | To apply for a job or to be visible for recruiters | 3 | 3 | 4 |

Doximity, and RadRounds as their second choice for education. ResearchGate is the most popular third choice (21 %). Respondents like to use social media for educational purposes mainly because it helps them to stay informed about new and interesting scientific papers or publications (64 %) and secondly because they are able to see and discuss interesting cases (48 %). Other reasons are the possibility to follow interesting opinion makers in radiology (41 %) and to distribute and discuss interesting papers with colleagues (35 %). Twenty-six percent of participants are familiar with “Figure 1,” which is a dedicated mobile platform for medical professionals. Few participants (40 %) like the platform mainly because of its educational value (20 %), international character (18 %), and easy and secure medical images having features (11 %).

Table 6 addresses the importance of social media during radiological meetings. More than half (56 %) of all respondents like using social media during such meetings, the main reason being the fact that they facilitate the interaction between attendees. USA-based radiologists apparently benefit more from this “socializing” effect than their European counterparts, whereas Europeans attach

more value to the information provided through social media during such meetings.

A large majority of participants sees a great future for social media in medicine and radiology (85 %). Most participants (73 %) believe that radiologists should engage more in social media because it enables them to find or provide relevant information (RS 3), because they are valuable for education and teaching (RS 2,7), because they are helpful in communication (RS 2,6) and because they can be used for marketing purposes (RS 1,7). There was no difference in ranking scores between the European and USA-based radiologists. Eighty-six percent of respondents support the idea that it should be possible to share radiological images safely via social media. Twenty-five percent of participants support the idea that patients should be able to share their medical information and radiological images through social networks and a similar percentage (26 %) opposes this notion.

Discussion

Principal Results

The first aim of this study was to investigate how radiologists are using social media and how they are integrating it into their professional activities. The second aim was to detect any differences in tendencies between radiologists based in Europe and North America regarding their usage of social media. The results show that a large majority of surveyed radiologists is using social media mostly for both private and professional reasons, with a clear preference for the private usage. For three quarters of all participating users, social media are popular for

Table 5 Ranking of risks and disadvantages of using social media

| | |
|------------------------------------------------------|------|
| Insufficient legislation, guidelines, and policies | 75 % |
| Risk for privacy of the patients | 39 % |
| Risk for privacy of radiologists | 39 % |
| Insufficient knowledge about SoMe among radiologists | 37 % |
| Distraction from clinical activities | 28 % |
| Deprivation from real social contact with others | 18 % |
| Danger of negative comments on our practice | 13 % |

Table 6 Usage of social media during radiological meetings

| Do you like using social media during radiological meetings? | Total n (%) | Europe n (%) | USA n (%) |
|---------------------------------------------------------------------|----------------|-----------------|--------------|
| Yes because they facilitate interaction between attendees | 61 (27) | 29 (24) | 26 (35) |
| Yes because they give me interesting information during the meeting | 20 (45) | 26 (22) | 11 (15) |
| Yes because they help me to select the best lectures | 20 (8) | 10 (8) | 3 (4) |
| No | 99 (44) | 54 (45) | 33 (45) |

private usage and for less than half of them (34 %) social media are popular for professional purposes. A similar discrepancy is visible in Europe and the USA. These data, in combination with the fact that 39 % of the non-users are not planning to use social media in the future and that as many are still in doubt about doing this, suggest that there are still some barriers to the use of social media. One of the most important cited reasons for not using social media is the fear of mixing personal and professional information. These findings also fit with the so-called online identity crisis of physicians, as described by M. DeCamp [10]. This online crisis is caused by the practical difficulties associated with strictly separating online professional and personal identities. DeCamp however states that, although most social media guidelines for medical professionals still recommend keeping personal and professional identities separated, it is operationally impossible and even nonsensical to separate online personal and professional identities [10]. Furthermore, many radiologists are reluctant to engage directly with patients using social media, which might be caused by an underlying anxiety about reputational damage and malpractice liability. Several lawsuits have already been conducted against physicians accused by patients of violating the privacy of medical information [6]. The second most important reason cited for radiologists' avoidance of social media is a shortage of time. In the 2013 survey conducted by Antheunis et al., the main barrier reported was the inefficiency of social media in terms of the perceived extra burden of time and resources placed on physicians [6]. It does seem, however, that the perceived need for familiarity with and improved knowledge of social media will lower barriers to their use. Increased integration of social media in postgraduate educational programs could be a gateway to solve the existing online identity crisis [10, 11]. The fact that 75 % of our survey participants think that currently there is insufficient legislation, guidelines, and policies for social media also demonstrates the necessity of further consensus building within the profession about how to use social media efficiently as radiologist, without violating patient confidentiality, personal privacy, and professional reputation. A discussion may be timely about how healthcare payment policy will need to recognize physicians' professional use of social media [6].

Facebook is by far the most popular platform among the survey participants for general social media activity, followed by LinkedIn and Twitter (see Table 3). Other recent studies

also confirm Facebook's preferred status for approximately 60 % of physicians [12, 13]. The ranking of social media for *professional* purposes appears to be different, since for most participants, LinkedIn is the first choice, followed by Facebook and Twitter. These findings are in accordance with a 2013 Dutch study in showed that 59 % of HCPs use one or more social media with a preference for Facebook. A quarter of HCPs uses social media for professional reasons, preferring LinkedIn followed by Twitter. From our study, it appears that among US-based radiologists Twitter outstrips LinkedIn for professional usage. Twitter does have the advantage of being a more flexible medium for sharing thoughts and actively engaging in discussions or so-called tweet-chats [14]. Analysis of Twitter traffic by the analytics platform Symplur (<http://www.symplur.com>) demonstrates that about 3.5 times as many US radiologists are using Twitter as their European counterparts (personal communication, June 24, 2015). From the study results, it also appears that for US-based radiologists, the second most important reason for using social media is the potential to promote ideas, increase influence, and make radiologists more visible to patients. In a recent study, it was shown that US-based AHs and PRPs are increasingly using Twitter to promote their activities and thus to increase their visibility [8]. The 2013 Dutch survey also showed that marketing and "presenting the hospital in the outer world" were among the most important drivers for HCPs to use Twitter professionally [6]. In the context of a changing healthcare environment and growing patient empowerment, use of social media is congruent with the ACR Imaging 3.0 initiative to maximize the perceived value and visibility of the radiologist. Connecting with patients through social media should enable radiologists to provide patients with general medical information and gain valuable insight in patients' perceptions about radiological examinations and services [8, 15, 16].

A large majority (82 %) of survey-participants is aware of the educational opportunities offered by social media. The Radiopaedia Facebook page is the most preferred platform among the educational social media for radiologists. Fifty-four percent of radiologists like to use social media during radiological meetings. Twitter has been reported to increase the engagement of participants at national radiology meetings [17]. During such meetings, the so-called tweet-chats are increasingly organized, which are pre-arranged chats or

discussions on Twitter. By using the hashtag-meeting name (e.g., #JACR) in every tweet, all meeting-related tweets are linked in a live Twitter-conversation between users following the meeting on site or from distance [18]. In the ASNR 2015 tweet-chat on the role of social media in scientific meetings, it was concluded that the main advantage of social media during such meetings is the fact that they “...allow attendees to post comments about sessions, engage in dialogue about content and interact with non-attendees.” The tweet-chat participants also believed that the role of social media in radiology meetings would not only grow but that social media could even turn into a real-time peer review of the sessions [19]. The results of the RANSOM-survey also indicate that using such platforms during meetings is appreciated by radiologists mainly because of the facilities it offers for socializing and for distributing relevant information.

Most of the radiologists surveyed are also in favor of sharing radiological images safely via social media among radiologists, whereas the idea that patients should be able to distribute their images through social networks garnered less support. From this survey, it appears that the usage of social media applications primarily aimed at image sharing is low. This concurs with the findings of a recently published study from Glover et al., which states that radiologists have not yet found much value in utilizing these services despite the image-dependent nature of radiology [8]. For sharing images and medical information more safely protecting the patient confidentiality new platforms exclusively targeting medical professionals are emerging, such as Figure 1 (<http://www.figure1.com>), which has been touted as “Instagram for doctors.” Despite being a good example of a dedicated professional social platform with the potential to improve international communication and collaboration in teaching, it appears from our survey that few respondents are familiar with it and that even less are using it.

From the results of this, survey can be deduced that there is potential for more active engagement of radiologists in social media for professional purposes. Adoption and integration of social media into radiological practice is strongly dependent on the perceived usefulness and value of the technology offered [20]. Efforts should be made to make radiologists more aware of the potential advantages and usefulness of social networking for professional purposes and to improve their skills in using them. In addition, radiological societies should create clear codes of conduct to help radiologists in using these platforms safely and efficiently. The investment of time which physicians make in social media is an area for future research as it pertains to workload benchmarks and financial compensation. An important unanswered question is whether a change in the prevailing attitude of medical professionals to the use of social media will in fact have a positive impact on health outcomes.

Limitations

Although the survey has provided some interesting insights into the motives behind the use and non-use of social media by radiologists, the study has a number of limitations. First of all, participants were mainly recruited online, which may have caused some bias in favor of radiologists with easier access to online communication methods. Seventy-eight percent (403) of all responses can be assigned to web-links that were distributed by a variety of digital media including e-mails, newsletters, and social media posting. Although it is not possible to calculate and compare the ratio of the media used, it cannot be excluded that a bias was introduced by responses elicited through social media postings. The remaining 22 % (113) of responses can be assigned to an invitation directly generated by the survey platform (SM), of which 103 were based upon e-mail and only 10 upon a Facebook posting. For this group, the potential selection bias is less significant. The response rate on invitations distributed by newsletters and social media postings is estimated at 1–2 % whereas the response rate on the mail-based invitations distributed directly from the survey platform was 17 % (679), meaning that most responses were based upon e-mail invitations, which should also reduce potential bias caused by social media postings. In their replies on the open questions about the most popular social media, many participants even mentioned conventional websites and e-books, indicating that not all participants were well experienced with “social media” and again reducing the chance of significant bias caused by the recruitment technique.

A second limitation of the survey is the fact that no distinction was made between age groups, making it impossible to discern the participants’ preferences and attitudes by age.

Finally, the participants from Europe, including many different countries with their own cultural, economic, and linguistic identity, probably form a less homogeneous group than those from the USA, making it rather difficult to compare them as two distinct entities.

Conclusions

This study generates several insights regarding the usage of social media by radiologists. First, it appears that most radiologists are using social media, but mostly for a combination of private and professional reasons in which the private part is still predominant. Secondly, the main differences between radiologists located in the USA and Europe regarding usage of social media can be found in the ranking of the most preferred social media for professional use, being Twitter in the USA and LinkedIn in Europe. For the US-radiologists, the main motivation to engage in social media is to make radiology more visible and to market their radiology services, whereas

for European radiologists, the ability to share interesting cases appears to be more important.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

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