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Digital work engagement among Italian neurologists

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Abstract

Background: Digital health, including telemedicine, is increasingly recommended for the management of chronic neurological disorders, and it has changed the roles of patients and clinicians.

Methods: In this cross-sectional study we aimed to investigate the digital work engagement of Italian neurologists through a survey collected between September 2020 and January 2021. Questionnaires were anonymous and collected demographic characteristics, attitudes towards digital devices and social media, and details about the clinician–patient relationship. We used logistic-regression models to identify characteristics associated with the propensity to communicate with patients using social media.

Results: Among the 553 neurologists who participated to the study, smartphones and computers were widely preferred compared with tablets; wearable devices were not common, although some neurologists desired them. A total of 48% of participants reported communicating with patients using social media but only a few were in favor of social friendship with patients; WhatsApp was the social media most popular for professional (86%) and personal (98%) purposes. Propensity to communicate with social media was significantly higher among those who were older ($p < 0.001$) and lived in regions outside northern Italy (center: $p = 0.006$; south and the islands: $p < 0.001$). For 58% of responders, social media improved their relationship with patients, but 72% usually warned patients about unreliable websites.

Conclusions: The preferred social media were those which were rapid and which safeguard privacy more effectively; neurologists made many efforts to disprove fake news circulating online, providing help to patients in various ways. This analysis can help direct future interventions for the management of chronic neurological disorders.

Keywords: Digital health, Neurology, Telemedicine

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Introduction

Social media and digital devices are increasingly used by physicians for retrieving health-related information, keeping up to date, enhancing professional development, communicating with patients, and providing online consultations.[1,2] In recent years, digital health that consists of use of social media, technologies, mobile phone apps, wearable devices, and technical tools for neurorehabilitation, has profoundly reshaped clinical practice and has been widely advocated for the management of chronic disorders, including

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several neurological diseases.[2–6] Telemedicine consists in an interface in the virtual relationship between patient and clinician and includes several branches such as telemonitoring, telemetry, teleconsulting, and telerehabilitation.[7] In this context, the role of the patient has changed, being placed at the center of self-care, thus becoming a 'digitally engaged patient.'[8] The digital engagement of patients certainly depends on patients' characteristics and clinical condition, as well as on digital infrastructures provided by the hospital. However, this depends also on physicians' propensity to use digital formats in clinical practice and thus to their own digital work engagement.[9] In 2018, the study group on 'Digital Technology, Web and Social Media' of the Italian Society of Neurology (SIN) carried out an observational study to assess the digital work engagement of Italian neurologists, investigating their attitudes, awareness, opinions, and experiences toward social media and digital devices (including wearable devices).[10] This survey revealed heterogeneous views and practices concerning the relationship with patients *via* social media, and the use of digital devices.[10] In the present study, we aimed to investigate the digital work engagement of Italian neurologists in the current period (2020/2021).

Methods

The study was designed by the group 'Digital Technology, Web and Social Media' of SIN. Between September 2020 and January 2021, 2850 members of SIN were invited to participate in an online survey; the questionnaire was completely anonymous, data were collected according to the standard rules on data protection (GDPR EU2016/679) and written informed consent was obtained from all the participants. The time needed to complete the questionnaire was about 10 min. Characteristics of non-responders were not available, and it was not possible to assess non-responder bias. The survey was designed to collect demographic characteristics of responders, attitudes towards their use of digital devices and social media in their routine clinical practice, and details on their relationship with the 'digitally engaged patients.' The English version of the survey is reported in the Supplemental Material. Data were presented as median (interquartile range, IQR) or proportion (%). We fitted univariate logistic-regression models to study the role of age, sex, and geographical area on the propensity to communicate with patients using social media. Subsequently, we ran a multivariate logistic-regression model including all variables with a p value < 0.15 in the univariate models. A two-sided α less than 0.05 was considered statistically significant. All statistical analyses were performed using Stata version 15.1 (Stata Corporation, College Station, TX, USA). The study was approved by the Ethical Committee of the University of Campania 'Luigi Vanvitelli' (protocol number 0014460/i).

Table 1. Characteristics of responders.

Age, median (IQR)	44 (35–55)
Male sex, *n* (%)	265 (48)
Italian geographical area, *n* (%)	
North	241 (44)
Center	101 (18)
South	165 (30)
Islands	46 (8)

IQR, interquartile range.

Results

At the deadline (31 January 2021), 533 neurologists gave their consent to participate in the current study. Participants completely answered all questions. The median age of the respondents was 44 years, and males (48%) and females (52%) were equally distributed; 30% of the responders were from southern Italy, there were 44% from the north, 18% from central Italy, and 8% from the islands (Table 1).

Many neurologists reported using computers or smartphones at work, while only 15% used tablets; the main reason to use digital devices was to stay informed on the health information circulating online (85%; Table 2). At work, few neurologists had the opportunity to use wearable devices, and some desired to have them available in their clinic, especially fit watches (47%) and skin patches (39%; Table 2).

Almost half the participants ($n = 266$, 48%) reported communicating with patients using social media (Figure 1). WhatsApp was the predominantly used media both in the personal and

Table 2. Digital devices in the professional environment.

Which devices do you use? *n* (%)		
Computer	536 (97)	
Smartphone	439 (79)	
Tablet	85 (15)	
The main purpose of using devices in clinical practice, *n* (%)		
To follow the disease evolution over time	417 (75)	
To provide information to colleagues and patients	317 (57)	
To keep up to date on health information circulating online	468 (85)	
To maintain contact within the medical community	439 (79)	
Wearable devices, *n* (%)	Available	Desired
iGloves	33 (6)	135 (24)
Eye tracker	18 (3)	178 (32)
Skin patch	9 (2)	216 (39)
Fit watch	41 (7)	258 (47)

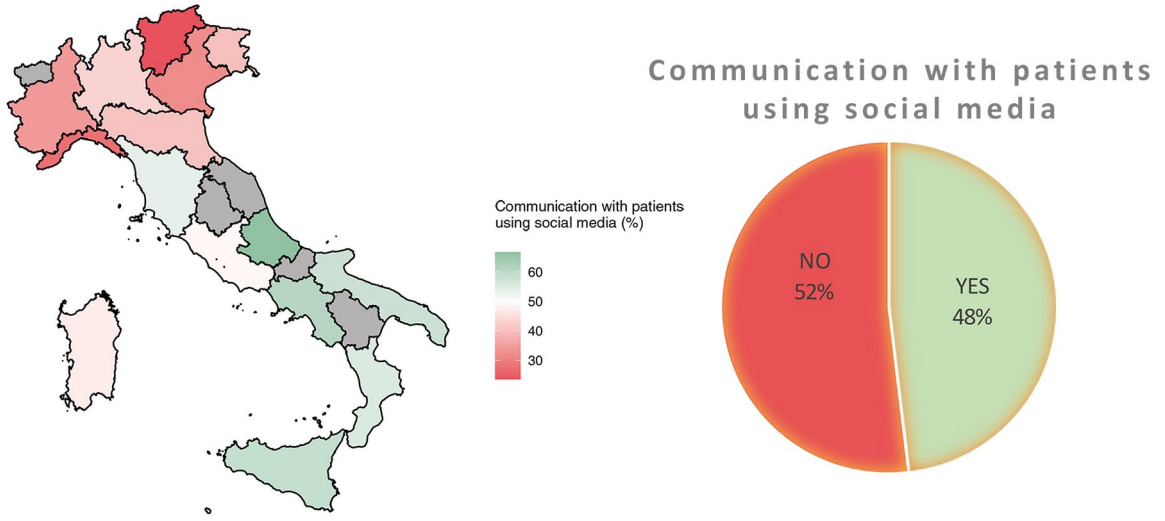

Figure 1. Communication with patients using social media.
A total of 266 (48%) neurologists communicated with patients using social media.

working environment (98% and 86%, respectively), while Facebook was used by almost 60% of neurologists at home, but by a few in the working environment (Table 3). Around 30% were much or very much in favor of this form of communication; conversely, 23% were completely against interacting with patients on social media, and only a few were much or very much in favor of social friendship with patients. For many neurologists (58%), social networks improved the relationship with patients; for others the relationship worsened or did not change.

Remarkably, communication with patients through social media was less frequently reported by neurologists from northern Italian regions

Table 3. Social networks.

In favor of using social media with patients, *n* (%)		
1 Not at all	125 (23)	
2	108 (20)	
3	160 (29)	
4	106 (19)	
5 Very much	54 (10)	
In favor of friendship with patients on social media, *n* (%)		
1 Not at all	359 (65)	
2	112 (20)	
3	55 (10)	
4	24 (4)	
5 Very much	3 (1)	
Do you reply to patients on social media outside clinical visits, *n* (%)	382 (69)	
How did social media influence the relationship with your patients? *n* (%)		
The relationship has worsened	136 (24)	
The relationship has not changed much compared with the past	98 (18)	
The relationship has improved	319 (58)	
Social networks used, *n* (%)	Personal	Work
Facebook	322 (58)	77 (14)
Twitter	114 (21)	46 (8)
YouTube	261 (47)	70 (13)
LinkedIn	113 (20)	143 (26)
WhatsApp	543 (98)	477 (86)
Skype	261 (47)	194 (35)

(Figure 1). Neurologists most prone to communicate with patients *via* social media were those who were older [odds ratio (OR) = 1.03; $p < 0.001$] and lived in the central Italy (OR = 1.95; $p = 0.006$), or southern Italy and the islands regions (OR = 2.65; $p < 0.001$; Supplemental Table1).

Regarding the attitudes towards the web, 12% of responders were active on specific health-related websites, and 10% had a personal site; blogs, podcasts, and forums were less frequently used (<5%). A total of 86% of participants had encountered patients who made a self-diagnosis on the internet; all responders usually helped their patients to consult the web, mainly to warn of unreliable websites (72%) and to recommend reliable ones (60%); 64% usually discussed fake news with patients by referring to results from scientific studies. Interestingly, 71% of the neurologists were also available to patients outside of visiting hours and the working environment (Table 4).

Table 4. Doctor–patient relationship and the internet.

Besides social media, how are you active as a neurologist on the internet? *n* (%)	
Personal website	54 (10)
Blog	9 (2)
Podcast	9 (2)
Forum	22 (4)
Apps for booking medical visits	67 (12)
Have you visited patients who had already made a self-diagnosis on the internet? *n* (%)	473 (86)
How do you help patients to consult the web to obtain medical information? *n* (%)	
Recommend reliable websites with scientific rigor	332 (60)
Warn against websites that provide inaccurate news	396 (72)
I update the patient on the latest fake news circulating on the web related to his/her disease	132 (24)
I recommend targeted trustworthy social networks	82 (15)
Availability of medical information on the web has changed the doctor–patient relationship, *n* (%)	
I try to regain the confidence of the patient by asking them to show me news updates that run on the web, then demonstrating the unreliability of some of these, on the basis of scientific studies	352 (64)
I do not follow the internet much, but am willing to explain to the most stubborn patients the reason for my medical opinions	152 (27)
I prefer not to question therapies and diagnoses with patients; my opinion comes from study and experience, and it must be enough to receive confidence from patients	49 (9)
Availability to patients outside the vising hours/working environment, *n* (%)	390 (71)

Discussion

In this survey we aimed to investigate the digital work engagement of Italian neurologists in 2020/2021, to study their attitudes towards digital use, and to evaluate the changes in their relationship with patients.

Among digital devices, few participants reported using the tablet for professional purposes, while smartphones were more widely used. Most of the features of tablets are available on computers or have been incorporated into smartphones, which are more portable, widely available, and encompass several functions useful for clinical practice. Concerning wearable devices, only a few neurologists had them available in their clinic, even if some desired to use them. This means that wearable devices were not completely accessible in clinical practice among the neurologists who were inclined to use them. Conversely, only a portion of responders desired having these devices available, which reflects the open debate on the superiority of wearable technology over follow-up neurological examinations for continuous and remote monitoring of patients.[11]

Almost half the participants communicated with patients through social networks; 69% were available to reply with patients on social media, and generally reported that the use of social media has improved their relationship with patients. However, only a few neurologists were completely in favor of social friendship with patients, and not surprisingly, a platform like Facebook, principally based on sharing content, was mostly used for personal instead of professional reasons. Moreover, having multiple

and separated friend lists to digitally reflect personal and private life is not always possible, or not always easy to achieve with such platforms. Conversely, WhatsApp, which can be used to quickly share messages with selected individuals, was also increasingly used in clinical activities. The preference for WhatsApp may thus be explained through privacy issues or also considering the need for a more rapid device used to convey clinical information in a situation characterized by considerable time restraints. However, despite instant messaging often being perceived as simple, cheap, and effective, users are generally unaware of potential confidentiality, consent, and data security issues, and guidelines for using such communication channels for telemedicine are yet to be defined.[12] More specifically, in Italy, rules on medical confidentiality (Codice Deontologico available at: https://portale.fnomceo.it/wp-content/uploads/2018/03/CODICE-DEONTOLOGIA-MEDICA-2014.pdf) still do not explicitly include or report any specific guidance on securing and sharing patient information on social media, or, more generally, on personal online communication.

A further relevant aspect to consider when using social media or WhatsApp, is data security. Specific risks of access to private patient information and other cybersecurity issues, such as malware, ransomware attacks, or system breaches, should be carefully evaluated in the choice of telemedicine systems.[13] This could also apply to the widespread use of emails to communicate with patients and share clinical information, which are exposed to the risk of data breach. Specific online platforms, such as Microsoft Teams, Zoom, or Webex are considered more compliant with sharing sensitive information, and their use could be considered by healthcare organizations, at least in the USA, where they comply with the Health Insurance Portability and Accountability Act.[14,15] According to an Italian study, from 1 March 2020 to 21 May 2020, 138 telemedicine tools had been developed, including apps, web-conferencing systems, and online platforms. Although this huge increase in the development and availability of telemedicine tools was driven by the coronavirus disease 2019 (COVID-19) pandemic, two thirds of them (92) were devoted to the management of other health conditions (6 for neurological disorders).[16] Whether and to what extent these telemedicine solutions comply with data protection and security was not explicitly investigated.

Around the world, there are many differences in telemedicine use and regulations and the quality or availability of technological support largely varies due to the high cost of telemedicine infrastructures, depending on economic resources of individual countries.[17–19] Even within Italy, there is a marked heterogeneity in the use of telemedicine for the management of neurological disorders; particularly during the current COVID-19 pandemic there has been an increase in its implementation, but more effort should be made to equip neurologists with the technological support for visits, increase digitization of healthcare, minimize digital devices, and overcome other logistic limitations, ensure protection and confidentiality of patient data, and regulate reimbursement.

Concerning demographic characteristics that may influence the communication with patients through social networks, our study confirmed what already showed in a prior survey: the propensity to use social media in communication with patients is associated with older age and origin from regions outside north Italy, while sex has no role.[10] It is known that some cultural and behavioral differences between northern and southern Italy persist and that traits of southern citizens are in favor of greater trust in others or pro-social behavior.[20] This may explain why neurologists from the north are less eager to use social media for communicating with patients, since they usually have more detached attitudes. Concerning the role of age, results may appear in contradiction with the common belief that the younger generation are 'tech savvy' and more prone to use technologies.[21] A possible explanation might be that younger neurologists, especially if recently graduated or still resident, do not usually have a deep relationship with their patients. It is also possible that younger physicians, who likely have higher knowledge of social media, are more aware of the risks and limitations of their use in professional activities, being therefore less inclined to communicate through them. Further studies should, however, further elucidate these aspects.

In this study, we also investigated the doctor–patient relationship in the digital world and, interestingly, we noticed that many responders mentioned the problem of fake news circulating online, and of self-diagnosis on the internet. Of note, many reported assisting patients to distinguish real news from fake news. This is not

surprising, since several fake news items circulate online nowadays, worldwide.[22–25] The spread of false news online represents a negative consequence of digitalization, which Italian neurologists try to refute by providing help to the 'digitally engaged patients.'

This study has some limitations. Characteristics of non-responders were not available and thus we could not compare responders with non-responders to assess non-responder bias. Data were not collected at individual patient level but summarized for neurologists; hence, patient characteristics were not taken into consideration. Details on how social networks such as WhatsApp and Facebook were used, on the use of specific platforms with inbuilt electronic medical records, and on the characteristics of telemedicine visits (e.g. inclusion in the call of individuals other than the patient, duration of each visits, costs) were not available. In future studies, it would also be interesting to investigate which are the preferred ways to contact patients (e.g. video or audio calls, text messaging) and to more specifically evaluate telemedicine modalities.

The years under study consist of a truly unique period due to the health emergency related to the severe acute respiratory syndrome coronavirus 2 pandemic. It is thus difficult not to consider the impact that the COVID-19 pandemic and its related changes in the clinical management of neurological patients had on the study results.[26] Future studies are thus required to further investigate the digital work engagement of neurologists and other physicians, especially at the end of the COVID-19 health emergency. In the future, greater attention and larger economic resources devoted to digital health are expected.[27] An accurate analysis of the actual digital work engagement of neurologists appears essential to decide where and how to intervene to improve the effectiveness of future interventions.

Author contributions

F Brigo: original draft preparation, conceptualization, methodology; M Ponzano: review and editing, conceptualization, formal analysis; MP Sormani: review and editing, formal analysis; M Clerico: conceptualization, review and editing; G Abbadessa: methodology, review and editing; G Cossu: methodology, review and editing; F Trojsi: conceptualization, review and editing; F Colucci: methodology, review and editing; C Tortorella: methodology, review and editing; G Miele: methodology, review and editing; E Spina: methodology, review and editing; CA Artusi: methodology, review and editing; L Carmisciano: formal analysis, review and editing; G Servillo: methodology, review and editing; M Bozzali: methodology, review and editing; M Sparaco: methodology, review and editing; L Leocani: conceptualization, review and editing; R Lanzillo: conceptualization, review and editing; G Tedeschi: conceptualization, methodology, review and editing; S Bonavita: conceptualization, methodology, review and editing; L Lavorgna: conceptualization, methodology, review and editing.

Conflict of interest statement

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Supplemental material

Supplemental material for this article is available online.

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