

ORIGINAL RESEARCH

Impact of COVID-19 on social media as perceived by the oncology community: results from a survey in collaboration with the European Society for Medical Oncology (ESMO) and the OncoAlert Network

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Background: The COVID-19 pandemic has impacted all aspects of modern-day oncology, including how stakeholders communicate through social media. We surveyed oncology stakeholders in order to assess their attitudes pertaining to social media and how it has been affected during the pandemic.

Materials and methods: A 40-item survey was distributed to stakeholders from 8 July to 22 July 2020 and was promoted through the European Society for Medical Oncology (ESMO) and the OncoAlert Network.

Results: One thousand and seventy-six physicians and stakeholders took part in the survey. In total, 57.3% of respondents were medical oncologists, 50.6% aged <40 years, 50.8% of female gender and mostly practicing in Europe (51.5%). More than 90% of respondents considered social media a useful tool for distributing scientific information and for education. Most used social media to stay up to date on cancer care in general (62.5%) and cancer care during COVID-19 (61%) given the constant flow of information. Respondents also used social media to interact with other oncologists (78.8%) and with patients (34.4%). Overall, 61.1% of respondents were satisfied with the role that social media was playing during the COVID-19 pandemic. On the other hand, 41.1% of respondents reported trouble in discriminating between credible and less credible information and 30% stated social networks were a source of stress. For this reason, one-third of respondents reduced its use during the COVID-19 pandemic. Regarding meeting attendance, a total of 59.1% of responding physicians preferred in-person meetings to virtual ones, and 51.8% agreed that virtual meetings and social distancing could hamper effective collaboration.

Conclusion: Social media has a useful role in supporting cancer care and professional engagement in oncology. Although one-third of respondents reported reduced use of social media due to stress during the COVID-19 pandemic, the majority found social media useful to keep up to date and were satisfied with the role social media was playing during the pandemic.

Key words: oncology, social media, cancer, COVID-19, virtual congress

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INTRODUCTION

Social media engagement has been growing within the medical community for the past decade including its use in oncology and cancer research. Although this recent increase has been linear, not all stakeholders may have experienced the same level of engagement.^{1,2} The COVID-19 pandemic

that began at the beginning of 2020 has been one of the most impactful social and medical events we have experienced globally in the past century, from our daily life to how we deal with cancer care.³ Although we have made large strides in technology and science, COVID-19 has shown us how vulnerable we still are and how important teamwork is to understand how to adapt our standards during such a pandemic and contain the virus.⁴ To achieve this, it is of dire importance that there is efficient, continuous, and reliable communication at all levels.⁴

Social media has taken center stage through all aspects of this pandemic, from the dissemination of information⁵ in the beginning (the OncoAlert roundtables, fast dissemination of ESMO adapted recommendations by cancer type) to consortiums to collect information about COVID-19 and cancer [such as the COVID-19 and Cancer Consortium (CCC19) and ESMO CoCARE among others].⁶ However, little is understood about how oncologists experienced receiving information from social media as well as sharing on social media their own personal views regarding oncology during the COVID-19 pandemic.

There has been previous work that has focused on social media and medicine.^{7,8} To our knowledge, this is the largest and most comprehensive survey that focuses on physician attitudes on social media during the COVID-19 pandemic. The aim of this survey was to determine how the oncology community was coping with the amount and quality of information, their experience with telemedicine as well as the level of stress induced by the pandemic-related communication. Ultimately, we wanted to get insights on the most suitable way of efficiently employing social media to design successful virtual or hybrid educational and interactive platforms in the future.

MATERIAL AND METHODS

A specific anonymous survey (see [Supplementary Material](https://doi.org/10.1016/j.esmoop.2021.100104), available at <https://doi.org/10.1016/j.esmoop.2021.100104>) was conceived and created by a collaboration between the ESMO Leaders Generation Program Alumni Members, the ESMO Social Media Working Group and the OncoAlert Network to explore the use of social media during the COVID-19 outbreak.

Oncology professionals from different continents were invited to take part in the survey.

The link to access the electronic questionnaire was sent by e-mail to ESMO members and shared through social media platforms (including a sustained presence on Twitter) on 8 July 2020. The survey was open for 15 calendar days and was structured with multiple choice answers and sliding scales. Since not all answers were mandatory, the number of respondents varied among questions.

Characteristics of the survey

The survey was composed of 40 questions grouped into different investigational sections: I) demographic, working and personal information (questions 1-7); II) attitudes toward social media usage (questions 8-13); III) attitudes

toward the use of social media specifically linked to the COVID-19 pandemic (questions 14-18); IV) perception toward virtual meetings and medical education during the COVID-19 pandemic and beyond (questions 19-32); V) personal and professional interactions during the COVID-19 pandemic and beyond (questions 33-40).

The attitudes and perceptions of oncologists toward these topics were assessed either by using five-point Likert scales (from 'not at all satisfied' to 'extremely satisfied' and from 'strongly disagree' to 'strongly agree'), by continuous percentage scale or by different answer options.

Study objectives

The survey was developed to understand the role of social media in sharing information during the COVID-19 pandemic. Moreover, it aimed at gathering feedback on participants' experiences of virtual meetings. The impact of the COVID-19 outbreak on attitudes of oncologists toward the use of social media was assessed taking the pre-pandemic time as reference. We also aimed to explore potential differences in the investigated topics according to age, geographical area of origin and duration of work experience among respondents.

Statistical analysis

Due to the descriptive nature of the study, no sample size calculation was pre-planned. However, by considering a target population of around 25 000 oncology professionals affiliated with ESMO who received the invitation to fill the survey along with the over 12 000 oncology professionals who follow OncoAlert on social media, we estimated reaching at least 1000 responses to allow a precision of approximately $\pm 3\%$ with a 95% confidence level in the prevalence estimates.

Characteristics of oncology stakeholders who participated were analyzed using descriptive statistics, and results were reported as the absolute number of respondents for each answer option on the total number of people responding to that specific question. In the case more than one option was allowed, the sum of percentages for each given answer would be $>100\%$.

In order to explore the differences in categorical variables on some answers according to age, geographical area of origin and duration of work experience of respondents, a chi-square test was applied. All tests were two-sided, and P values <0.05 were considered statistically significant.

RESULTS

A total number of 1076 oncology stakeholders completed the questionnaire. [Table 1](#) shows their demographic, working and personal information. Most of the respondents were medical oncologists (57.3%, $n = 617$) or clinical oncologists ($n = 114$, 10.6%) practicing in Europe (51.5%, $n = 555$; 37.7% and 13.8% in Western and Eastern Europe, respectively). About half of respondents (50.6%, $n = 544$) were aged <40 years and were female (50.8%, $n = 547$). Among ESMO members, 48.0% were female ($n = 293$) and

Table 1. Characteristics of respondents	
Region of practice	n (%)
Western Europe	406 (37.7)
Eastern Europe	149 (13.8)
North America	99 (9.2)
Central and South America	86 (8.0)
Asia	262 (24.3)
Africa	53 (4.9)
Oceania	19 (1.8)
Other	2 (0.2)
Age (years)	
<30	134 (12.5)
31-40	410 (38.1)
41-50	270 (25.1)
51-60	179 (16.6)
>60	83 (7.7)
Gender	
Female	547 (50.8)
Male	521 (48.4)
I prefer not to say	8 (0.7)
ESMO member	
Yes	860 (79.9)
No	216 (20.1)
Medical specialty	
Medical oncology	617 (57.3)
Clinical oncology	114 (10.6)
Radiation oncology	88 (8.2)
Surgical oncology	37 (3.4)
Oncology nurse	13 (1.2)
Nurse	4 (0.4)
Basic researcher/scientist (not medically qualified)	45 (4.2)
Patient advocate	50 (4.6)
Other	108 (10.0)
Years of medical practice (n)	
<5	153 (14.2)
5-10	208 (19.3)
>10	495 (46)
Not specified	220 (20.4)
Working environment	
Public academic hospital	561 (52.1)
Public nonacademic hospital	85 (7.9)
Private hospital	123 (11.4)
Both (public/private)	118 (11.0)
Private practice	44 (4.1)
Other	145 (13.5)

44.1% were aged <40 years ($n = 269$). A total of 33.5% ($n = 361$) of respondents had been working in oncology for up to 10 years and slightly more than half of respondents were employed in public academic hospitals (52.1%, $n = 561$).

Attitudes toward social media usage

A complete overview of attitudes of oncology professionals toward the use of social media is displayed in [Supplementary Table S1](https://doi.org/10.1016/j.esmooop.2021.100104), available at <https://doi.org/10.1016/j.esmooop.2021.100104>.

A total of 79.2% ($n = 807$) of respondents spent ≤ 1 h per day on social media for professional purposes. The vast majority of respondents believed in the role of social media as a useful tool for communicating and distributing scientific and medical information (94%, $n = 1011$), and for educating and training (92.8%, $n = 998$). Twitter was the preferred platform for these uses, either toward health care professionals (64.7%) or toward patients (39.3%). LinkedIn

was preferred by 68.4% of respondents for its interactive role, particularly toward colleagues, while Facebook and Instagram were chosen mainly for use with patients, being preferred by 61.3% and 45.1% of surveyed, respectively.

A total of 41.1% of respondents ($n = 419$) reported having trouble discriminating between credible and less credible information on social media ([Figure 1](#)).

Attitudes toward the use of social media related to the perception of participants about the COVID-19 pandemic

A complete overview on attitudes of oncology professionals toward the use of social media related to the perception about the COVID-19 pandemic is displayed in [Supplementary Table S2](#), available at <https://doi.org/10.1016/j.esmooop.2021.100104>.

A total of 62.5% ($n = 628$) and 61% ($n = 613$) of respondents reported using social media to stay up to date with the latest medical and scientific information regarding cancer care, in general, as well as cancer care and COVID-19, respectively ([Figures 2A and B](#)).

The constant flow of information regarding the COVID-19 pandemic via social media was of utility for many oncology professionals, representing a source of updated news and a source of inspiration for 33.8% ($n = 339$) and 15% ($n = 151$) of respondents, respectively. On the contrary, it caused stress and worry in 30% of respondents ($n = 302$). During the COVID-19 pandemic, 30.4% ($n = 305$) and 18.9% ($n = 190$) of oncology professionals reacted by reducing or by increasing the time spent on social media, respectively ([Figure 3](#)). A statistically significant difference in this attitude was observed among younger (aged <40 years) and older respondents ($P = 0.004$), with more young respondents reducing the use of social media (see [Supplementary Material](#), available at <https://doi.org/10.1016/j.esmooop.2021.100104>). The relative reduction or increase in the use of social media compared with the pre-COVID-19 era was mainly by 25%-50%.

Perception toward virtual meetings and medical education during the COVID-19 pandemic and beyond

A complete overview on the perception of oncology professionals toward virtual meetings and medical education during the COVID-19 pandemic and beyond is displayed in [Supplementary Table S3](#), available at <https://doi.org/10.1016/j.esmooop.2021.100104>.

A total of 91% ($n = 905$) of respondents took part in at least one virtual local/national or international oncology meeting during the COVID-19 pandemic. A total of 77.6% of respondents ($n = 697$) liked the virtual modality, but 59.1% ($n = 531$) still preferred the in-person meetings, and 59.7% ($n = 565$) suggested adopting a hybrid model for oncology meetings (part in person and part virtual) in the future. The possibility of lower attendance of a virtual compared to an in-person meeting emerged: 46.3% of respondents ($n = 438$) declared they would only attend sessions of interest in case of future virtual congresses, and 22.8% ($n = 216$) would allocate less time by attending only half the meeting if organized with

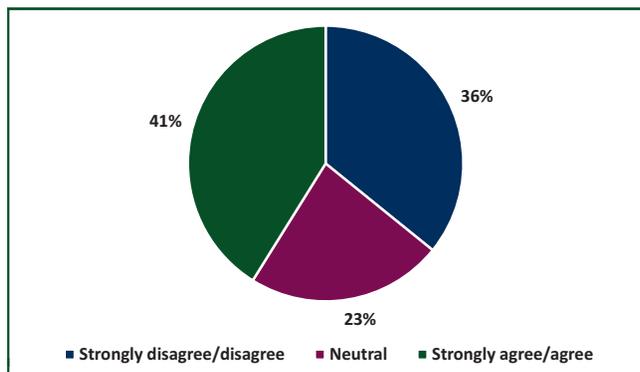


Figure 1. Question 11: I have trouble discriminating between credible and less credible information on social media.

Total respondents = 1019.

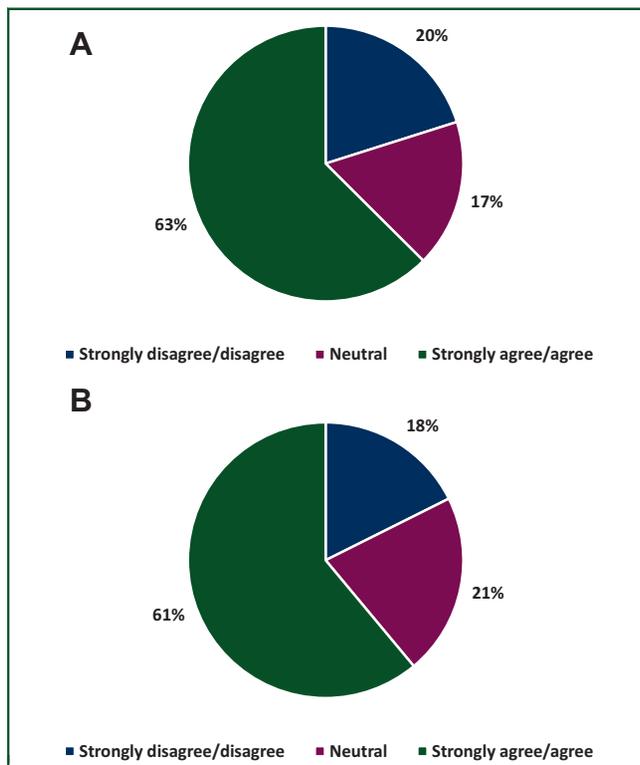


Figure 2. (A) Question 14a: I use social media to stay up to date with the latest medical and scientific information regarding cancer care in general (total respondents = 1004). (B) Question 14b: I use social media to stay up to date with the latest medical and scientific information regarding cancer care and COVID-19 (total respondents = 1004).

virtual instead of in-person modality. Younger respondents aged <40 years were more likely to attend virtual congresses ($P = 0.044$) (see [Supplementary Material](https://doi.org/10.1016/j.esmooop.2021.100104), available at <https://doi.org/10.1016/j.esmooop.2021.100104>).

With regards to virtual congresses, live sessions including discussions, sessions immediately available to replay in different time zones, and sessions available on demand after the meeting were the most important features (important, very important or extremely important for 82%, 91.9% and 94% of respondents, respectively).

A total of 69.4% of respondents stated their willingness to eventually pay to attend a virtual meeting, but at a lower price compared with the corresponding in-person event.

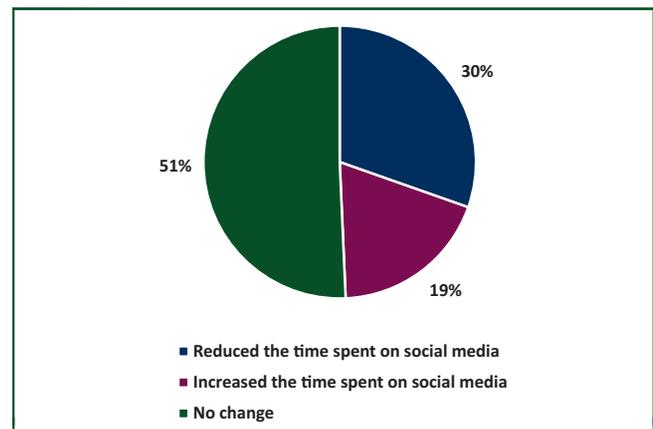


Figure 3. Question 16: To avoid extra stress during the COVID-19 pandemic I have...

Total respondents = 1004.

A total of 51.8% of respondents ($n = 471$) agreed/strongly agreed that virtual meetings and social distancing could hamper effective collaboration (Figure 4). No differences were observed according to the geographical area of practice ($P = 0.250$), age of respondents ($P = 0.156$) or years of practice ($P = 0.815$) (see [Supplementary Material](https://doi.org/10.1016/j.esmooop.2021.100104), available at <https://doi.org/10.1016/j.esmooop.2021.100104>).

Of the respondents, 49.9% stated that virtual congresses provide the same level of education/scientific material and should be implemented in the future regardless of the COVID-19 situation. A total of 74.6% ($n = 683$) of respondents would expect medical societies to increase their use of social media platforms to better engage with the individual in the setting of virtual meetings.

Personal and professional interactions during the COVID-19 pandemic and beyond

A complete overview on personal and professional interactions of oncology professionals during the COVID-19 pandemic and beyond is displayed in [Supplementary Table S4](https://doi.org/10.1016/j.esmooop.2021.100104), available at <https://doi.org/10.1016/j.esmooop.2021.100104>.

A total of 78.8% of respondents ($n = 712$) reported using social media to interact with other oncologists. Moreover, one-third (34.4%, $n = 310$) considered social media to be an appropriate platform to engage with patients (Figure 5), but generally with a low grade of engagement. No differences were observed in this perception according to gender ($P = 0.079$) or age ($P = 0.415$), but a statistically significant difference was observed between Western and Eastern Europe ($P = 0.002$), with social media less frequently used to keep in touch with patients in Western countries (see [Supplementary Material](https://doi.org/10.1016/j.esmooop.2021.100104), available at <https://doi.org/10.1016/j.esmooop.2021.100104>).

About half of respondents (51.9%, $n = 463$) spent <5 h a week on teleconferences/video conferences.

A total of 51.4% of respondents ($n = 458$) dedicated up to 40% of daily patient visits through telemedicine during the COVID-19 pandemic, but only 34% ($n = 303$) considered

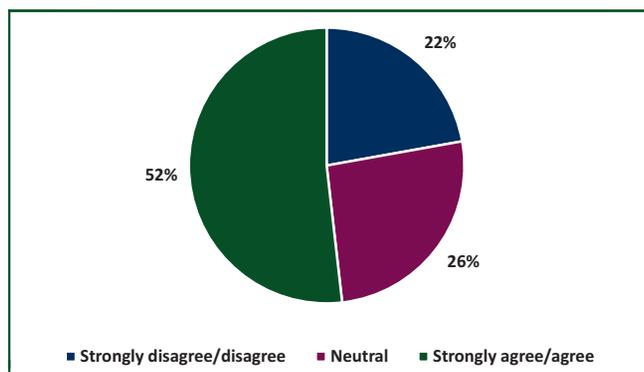


Figure 4. Question 27: I am afraid that virtual meetings and social distancing will hamper effective collaboration.

Total respondents = 915.

it an adequate substitute for face-to-face consultations that shall be sustained after the COVID-19 pandemic. There were no observed differences according to the geographical area of practice ($P = 0.075$) (Figure 6 and Supplementary Material, available at <https://doi.org/10.1016/j.esmooop.2021.100104>).

DISCUSSION

Through this survey, we were able to examine the current attitudes of cancer care professionals toward social media in many different aspects, ranging from professional to personal, and how this has been impacted by the ongoing COVID-19 pandemic. To our knowledge, this survey is the largest of its kind focused on oncology social media. Rather than restricting answers to just a specific region or population, our goal was to get the broadest view possible of how oncology professionals have been affected and their current attitudes. In doing so, we aimed to pinpoint any differences that may exist due to global inequities (e.g. infrastructure, low economic resources, etc.) and due to other factors (e.g. culture, age or gender). Although our target audience was medical oncologists (half of participants), the survey also included primary care physicians treating cancer, radiation and surgical oncologists, oncology nurses and to a lesser extent patient advocates. The use of social media platforms varies from regions to countries. However, regarding oncology social media, the majority of interactions in terms of education and networking (especially in North America and Western Europe) are through Twitter. In order to ensure an acceptable global representation within this survey, we also extended the invitations through Facebook and Instagram, as these are platforms of choice in other parts of the world.⁹

A quick breakdown of the survey shows that 50% of the survey respondents were from Europe and 25% were from Asia. North America has for many years set the standard when it comes to professional social media (often Twitter); however, North American participation in this survey was only 9% of respondents. There was a very even split between gender and about 63% of the respondents were between the ages of 31 and 50 years, with the largest single

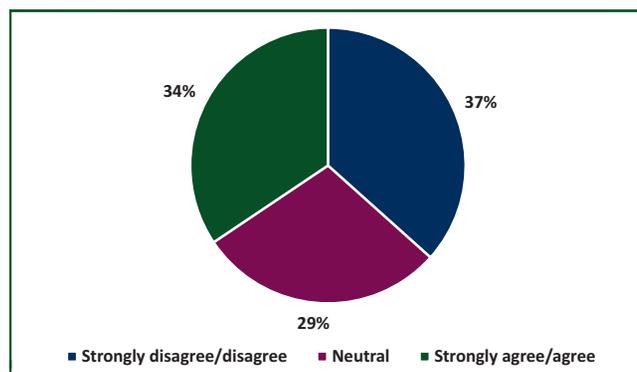


Figure 5. Question 34: Social media platforms are an appropriate space to engage with patients.

Total respondents = 901.

group of respondents (38%) being within the ESMO definition of a young oncologist or an early-career oncologist.¹⁰ Overall, these responses best represent a male or female medical oncologist who is an ESMO member, working in an academic hospital in Europe or Asia and is between the age of 31 and 40 years and has been practicing for >10 years. These demographics are very similar to the majority of ESMO membership and one could assume that the attitudes seen in this survey could be representative of the average ESMO member.

The past years have seen a rise in Twitter engagement by oncologists and hematologists and Twitter acts as a tool to engage and strengthen global collaborations.¹¹ However, its use extends the professional dimensions to the public, patients and patient advocates to learn and communicate as it is a tool widely used by these groups.¹²

One of the biggest problems social media has encountered is the rise of 'fake news' or simply information that is misleading or erroneous and could be easily propagated.^{13,14} This survey shows that oncology social media is not excluded from this phenomenon as 41% of participants (430/1048) agreed that it is hard to discriminate between credible and less credible information on social media while 23% were neutral on this topic. These findings highlight a serious concern, as our colleagues disclose their inability to distinguish posts that are real from those that are not. Although these results are alarming, they indicate the possible need to have a credible source of information, whether it would come directly from professional social media networks such as OncoAlert or via scientific and professional societies (e.g. ESMO).

An increase in stress has become synonymous with the pandemic.^{15,16} The physical and psychological implications that come with treating patients during the pandemic have been studied, demonstrating disturbances in sleep, mood and an increase in anxiety.¹⁷ Half of the participants of the survey did not change their use of social media in order to reduce stress. Two recent surveys conducted by the ESMO resilience task force in collaboration with the OncoAlert Network looking at oncologist resilience during the pandemic have found that feelings of burnout were experienced by 49% of survey participants in July 2020. This had

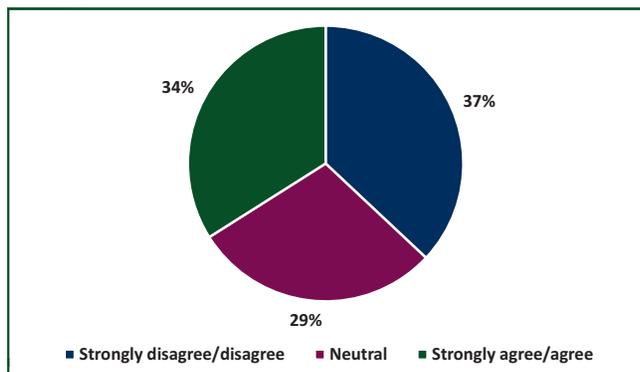


Figure 6. Question 39: Telemedicine is an adequate substitute for in-person consultation and should be maintained after the COVID-19 pandemic.

Total respondents = 892.

risen from 38% at the time of the first survey in April 2020,^{18,19} suggesting that burnout was increasing as the pandemic progressed.

In our survey, the majority of participants who reduced their time spent on social media during COVID-19 to avoid stress did so by 25% and 50%. This could be indicative of the results on burnout from the ESMO resilience task force survey, as those feelings of burnout may have led to a reduction of time on social media. On the other hand, those who increased their time spent on social media during COVID-19 to stay updated did so by 25 to 50 percent. A total of 33.8% of respondents felt that the constant flow of COVID-19 information ‘makes them confident that they are up to date with the latest information’ and 15% were inspired to engage.

Virtual meetings have become the norm in the current day. Survey participants were asked if they felt that the virtual congresses provided the same level of education/scientific material and if they should be implemented in the future regardless of COVID-19; half agreed, while 23.2% were neutral.

The fact that half of the respondents felt so positive indicates that despite the return of the in-person meeting, there is much benefit to keeping part of the virtual meeting. During the pandemic, oncology education was able to continue due to the swift action of societies in incorporating virtual meetings.

The survey posed the question of whether one was afraid that virtual meetings and social distancing would hamper these collaborations and over half of our participants fear that the switch would in fact hamper effective collaboration.

One thing to note is the fact that this survey was conducted after the American Association for Cancer Research 2020 & American Society of Clinical Oncology 2020 annual meetings; hence not many of the participants had much experience regarding virtual meetings, while virtual experience has benefited many technical improvements including interactivity that was highly appreciated and successful during recent ESMO events (ESMO annual, ESMO Asia, ESMO IO). As time has gone by, the virtual meeting

has developed and attitudes may not be the same, with a possible better opinion about virtual meetings.

In order to understand how respondents were interacting with other oncologists, they were asked about their social media interactions: 21.3% did not use social media to interact with other oncologists, 30.3% contacted via direct messages and 34.9% did so via both direct message and responding to tweets or posts. These results show a potential area of improvement in terms of collegial communication in order to improve collaboration.

Although there will come a time where in-person meetings can resume, it is almost a guarantee that hosting >10 000 participants will be a difficult task as guidelines about safety must be put into place.²⁰ In this situation, the virtual meeting remains a safe and effective way of communicating cancer trial results, spreading information and forming collaborations, with the flexibility to adapt to the needs of the attendee.²¹

The use of telemedicine has become increasingly frequent in oncology, with studies showing that telemedicine in cancer can improve symptom management and comfort with care.^{22,23} The survey asked participants if they thought telemedicine is an adequate substitute for in-person consultation and if it should be sustained after the COVID-19 pandemic and the responses were similar to what we had expected. In North America, 38% of the participants agreed with the question, which could be due to an already established and implemented telemedicine innovation in US health systems.²⁴ In Western Europe, on the other hand, 27% agreed and 35% disagreed that telemedicine was an adequate substitute. Asia showed a similar trend to that of Western Europe. These results could be influenced by differences in telemedicine access and higher use in the private versus public sector, considering that Western European countries tend to rely heavily on public healthcare systems. Another possible explanation is that 27.9% of the participants had no telemedicine, which could mean that their negative view toward it could partially be due to insufficient previous training and lack of experience. Additionally, globally, adequate billing for telemedicine remains a matter of ongoing debate.

It is uncertain as to when we will return to in-person consultations; telemedicine has become a good way to protect our patients and our health care workforce. However, in order for this to be an adequate substitute, the right infrastructure has to be in place in order for it to function.

Social media has allowed different stakeholders to be in the same discussion; from treatments, trial design to new research, patients and patient advocates are engaging on social media. The survey asked if participants thought social media platforms were an appropriate space to engage with patients; on this aspect, there was a 5% increase in those >40 years of age compared with those aged <40 years. In comparing geographic differences, North America and Eastern Europe have the same level of agreement; Western Europe and Asia also had similar levels. One possible reason for this is that North America has a long

history of social media and patients have been using it longer, often in collaboration with many societies. This survey sees that in general the attitude toward interactions in social media with patients is somewhat negative. Participants were asked to put on a sliding scale how they felt about such interactions: on a scale of 0%-100%, over 41% chose 0%-20% with the majority at 0% (20.8%). This shows that in order to bridge the gap of communication between doctors and patient advocates, we need to focus on changing the attitudes of physicians on social media regarding this interaction. The past decade has seen a move to a more patient-centered care, where the physician tries to enter the patient's world and see the illness through their eyes in order to better understand it.²⁵ Having patient advocates involved in discussions of cancer and cancer care provides unique viewpoints that allow us to ensure that our medical advances are relevant and patient centered.^{26,27}

The COVID-19 pandemic has pushed social media into center stage. It is being used for the dissemination of reliable information as it emerges, sharing practical experiences in real time and facilitating international collaborations to collect data. The results of this survey provide evidence on the role social media plays in supporting cancer care and professional engagement in oncology during the pandemic, giving important insight into how the oncologist communicates, learns and interacts. However, these insights may not reflect the entirety of the oncology community. There is a potential bias as those who participated are possibly more engaged in social media and therefore overrepresented.

These results highlight specific pitfalls where more can be done like nurturing the oncology professional advocate communication, expanding oncology social media among other sectors and better supporting our oncology professionals during the pandemic.

There is potential in using this data in order to design the future use of social media engagement and conferences in a way that will better address the needs of the oncology community in order to provide the most convenient and useful service to colleagues, thus getting all stakeholders involved in the same conversation. The results could be used by oncology societies in tailoring the way that they communicate and engage with their members during the pandemic and addressing their concerns and needs. Through better understanding of the use of social media by our colleagues, we can further accelerate the dissemination of medical knowledge which can help both physician–physician and physician–patient interaction and aid in the creation of national and international scientific networks to serve oncological care and support to contain the pandemic.

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DISCLOSURE

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REFERENCES

- Adilman R, Rajmohan Y, Brooks E, et al. Social media use among physicians and trainees: results of a national medical oncology physician survey. *J Oncol Pract* 2016;12:79-80. e52-e60.
- Carley S, Beardsell I, May N, et al. Social-media-enabled learning in emergency medicine: a case study of the growth, engagement and impact of a free open access medical education blog. *Postgrad Med J* 2018;94:92-96.
- Poggio F, Tagliamento M, Di Maio M, et al. Assessing the impact of the COVID-19 outbreak on the attitudes and practice of Italian oncologists toward breast cancer care and related research activities. *JCO Oncol Pract* 2020;16:e1304-e1314.
- Lambertini M, Toss A, Passaro A, et al. Cancer care during the spread of coronavirus disease 2019 (COVID-19) in Italy: young oncologists' perspective. *ESMO Open* 2020;5:e000759.
- Cinelli M, Quattrocioni W, Galeazzi A, et al. The COVID-19 social media infodemic. *Sci Rep* 2020;10:16598.
- Kuderer NM, Choueiri TK, Shah DP, et al. Clinical impact of COVID-19 on patients with cancer (CCC19): a cohort study. *Lancet* 2020;395:1907-1918.
- Parwani P, Choi AD, Lopez-Mattei J, et al. Understanding social media: opportunities for cardiovascular medicine. *J Am Coll Cardiol* 2019;73:1089-1093.
- Markham MJ, Gentile D, Graham DL. Social media for networking, professional development, and patient engagement. *Am Soc Clin Oncol Educ Book* 2017;37:782-787.
- Fuller MY, Allen TC. Let's have a tweetup: the case for using Twitter professionally. *Arch Pathol Lab Med* 2016;140:956-957.
- Morgan G, Lambertini M, Kourie HR, et al. Career opportunities and benefits for young oncologists in the European Society for Medical Oncology (ESMO). *ESMO Open* 2016;1:e000107.
- Attai DJ, Anderson PF, Fisch MJ, et al. Risks and benefits of Twitter use by hematologists/oncologists in the era of digital medicine. *Semin Hematol* 2017;54:198-204.
- Moorhead SA, Hazlett DE, Harrison L, Carroll JK, Irwin A, Hoving C. A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication. *J Med Internet Res* 2013;15:e85.
- Naeem SB, Bhatti R, Khan A. An exploration of how fake news is taking over social media and putting public health at risk. *Health Info Libr J* 2020. <https://doi.org/10.1111/hir.12320>.
- Wang Y, McKee M, Torbica A, Stuckler D. Systematic literature review on the spread of health-related misinformation on social media. *Soc Sci Med* 2019;240:112552.
- Bohlken J, Schömig F, Lemke MR, Pumberger M, Riedel-Heller SG. COVID-19-Pandemie: Belastungen des medizinischen Personals. *Psychiatr Prax* 2020;47:190-197.
- Lupe SE, Keefer L, Szigethy E. Gaining resilience and reducing stress in the age of COVID-19. *Curr Opin Gastroenterol* 2020;36:295-303.
- Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun* 2020;92:245.
- Burki TK. Burnout among cancer professionals during COVID-19. *Lancet Oncol* 2020;21:1402.
- Banerjee S, Jonathan Lim KH, Murali K, et al. The impact of COVID-19 on oncology professionals: results of the ESMO Resilience Task Force survey collaboration. *ESMO Open* 2021;6:100058.
- Rubinger L, Gazendam A, Ekhtiari S, et al. Maximizing virtual meetings and conferences: a review of best practices. *Int Orthop* 2020;44:1461-1466.
- Porpiglia F, Checcucci E, Autorino R, et al. Traditional and virtual congress meetings during the COVID-19 pandemic and the post-COVID-19 era: is it time to change the paradigm? *Eur Urol* 2020;78:301-303.
- Worster B, Swartz K. Telemedicine and palliative care: an increasing role in supportive oncology. *Curr Oncol Rep* 2017;19:37.
- Shirke MM, Shaikh SA, Harky A. Implications of telemedicine in oncology during the COVID-19 pandemic. *Acta Biomed* 2020;91:e2020022.
- Hollander JE, Carr BG. Virtually perfect? Telemedicine for Covid-19. *N Engl J Med* 2020;382:1679-1681.
- Kaba R, Sooriakumaran P. The evolution of the doctor-patient relationship. *Int J Surg* 2007;5:57-65.
- Selig W, Banks I, Davis A, DeCotiis G, Hohman R, Schlager L. Incorporating patient advocates in oncology clinical development: lessons learned from a novel pilot program. *Ther Innov Regul Sci* 2019;53:349-353.
- Salamone JM, Lucas W, Brundage SB, et al. Promoting scientist-advocate collaborations in cancer research: why and how. *Cancer Res* 2018;78:5723-5728.