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Scientific Article

Current Social Media Use Among Radiation Oncology Trainees

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Abstract

Purpose: Resident physicians use social media (SM) for many reasons. We sought to characterize current SM use by radiation oncology (RO) trainees for education and professional development.

Methods and Materials: An anonymous 40-question survey was sent by e-mail to RO residents in the 2018 to 2019 academic year. SM platform use, time spent on SM, professional use, and opinions regarding SM use were assessed. Descriptive statistics and a univariate logistic regression analysis were performed to identify factors associated with perceptions of SM and spending >25% of SM time for academic or professional purposes.

Results: Of the 615 residents surveyed, 149 responded (24% response rate). Facebook (73%), theMednet (62%), Instagram (59%), Twitter (57%), and Doximity (50%) were the top SM platforms used. Most respondents (53%) reported <25% of overall SM time on professional/academic purposes, and 21% reported using SM >60 minutes per day over the past week. Residents with an RO mentor on SM (n = 35; 24%; odds ratio [OR]: 2.79; 95% confidence interval [CI], 1.29-6.08; $P = .010$), those participating in RO discussions on SM (n = 71; 48%; OR: 2.85; 95% CI, 1.42-5.72; $P = .003$), and those interacting with professional societies (n = 69; 46%; OR: 7.11; 95% CI, 3.32-15.24; $P < .001$) were more likely to spend >25% of their SM time on professional/academic purposes. The vast majority of respondents agreed that SM exposed them to novel educational content (82%) and was helpful for career development (65%). In addition, 69% agreed that SM can improve clinical skills and knowledge. A substantial minority agreed that SM distracts them from studying (38%) or they felt pressure to have a SM presence (29%).

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Research data are stored in an Association of Residents in Radiation Oncology repository and will be shared upon request to the corresponding author.

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Conclusions: Most RO residents reported that SM provides novel educational content and can help with career development. Potential disadvantages of SM for trainees may include distraction and pressure to maintain a SM presence. SM use by RO trainees merits further research to optimize its potential for education and professional development.

Introduction

The field of radiation oncology (RO) trains residents to be knowledgeable in all aspects of cancer care, which requires continual learning of new evidence-based information and clinical trials. Medical trainees in many specialties are increasingly using social media (SM) to access and distribute educational and professional information.[1-3] SM may offer an additional means by which RO residents can obtain and assimilate current information that enhances their oncologic training.

The benefits of SM use have been promoted to oncologists by oncologic societies as evidenced by the inclusion of educational sessions and tweetups at many oncology academic conferences and the development of specific SM platforms and guidelines for radiation oncologists.[4-6] However, several studies have highlighted the potential risks of SM for trainee professionalism.[1,2] The blurred boundaries between personal and professional use of SM is a reason many trainees may opt not to use SM for professional purposes.[7,8] There is growing concern about the effects of technology and specifically SM on learning.[9] Studies investigating online reading and information-seeking behaviors have found that some forms of online information result in lower processing depths, reduced attention allocation, selective reading, and decreased sustained attention compared with other forms of media.[10]

As digital resources available to physicians evolve and online connectivity via SM increases, recognizing how and if such technologies impact resident medical education is important.[1] The aim of this survey was to characterize perceptions surrounding SM among residents and evaluate current use of SM during RO training.

Methods and Materials

Survey design

We obtained institutional review board exemption for an anonymized survey before distribution to RO residents using the contact list from the Association of Residents in Radiation Oncology (ARRO). A survey questionnaire was developed using questions pretested among a small group of RO residents and attending radiation oncologists.

The survey consisted of a maximum of 40 questions (Appendix A). Questions consisted of a combination of 1-to-5, Likert-like, scaled response options (strongly agree, agree, neutral, disagree, and strongly disagree), multiple-choice questions, and check all that apply items. We assessed the most frequently used SM platforms, other online forums, and e-mail subscriptions based on listed choices with a write-in option. To assess SM use for education and learning, the survey included questions on interactions within RO, other professionals, journals, health organizations, advocates, and patients. We also evaluated the frequency of using SM to identify and communicate with mentors. Because SM use may present challenges in separating personal and professional identity, we included questions to determine the frequency of using different names in personal and professional settings as well as online.

We asked trainees to quantify and describe time using SM. We used categories for time and usage of SM derived from the psychometrically validated social networking time use scale.[11] We assessed the proportion of time spent online for academic and professional purposes, as well as settings in which residents used SM. To better understand the perceived benefits of SM use, the survey included questions about its potential for educational and clinical value, career development, and sense of belonging in the RO community. We also assessed potential problems of information overload, distraction from studying, distraction from patient care, feeling pressure to use SM professionally, and blurring boundaries between trainees and attending physicians at training institutions. To assess the use of other types of digital resources distinct from SM, the survey included questions related to online academic journal use, e-mail subscriptions, and other online resources. We collected responses anonymously through SurveyGizmo. All questions were marked as mandatory for completion to minimize missing data due to item nonresponse.

Study cohort definition and contact/recruitment

A total of 615 residents were identified through ARRO's database. A survey was e-mailed to these residents on May 9, 2019, with a follow-up reminder e-mail sent every week for 3 weeks. A final e-mail reminder was sent on June 30, 2019. Reminders were also included in the ARRO monthly e-mail newsletters and posted on ARRO SM accounts, including Twitter and the closed

Facebook group, and was included in the ARRO monthly e-mail newsletters. Residents who had not completed the survey were contacted individually. To encourage response, a coffee gift card of $5.00 was offered to the first 200 respondents after survey completion.

Statistical analysis

Descriptive statistics were used to assess self-reported trainee use of SM platforms, time spent on SM, professional use of SM, and opinions regarding SM use. Univariate analyses were performed to identify factors associated with select perceptions about SM and identify factors associated with spending >25% of one's SM time on academic or professional purposes. All statistical analyses were performed using Stata, version 16.1.

Results

Response rate and characteristics of respondents

A total of 615 residents were surveyed, and 149 responded, resulting in a 24% response rate. Table 1 includes the demographic information of the respondents. Over half of the respondents were male (58%), and the majority (75%) were in the age range of 30 to 39 years.

When asked if using different names on SM relating to personal life, 15 of 149 respondents (10%) reported using different names on Facebook, 60% of whom were female (n = 9). Fifteen of 149 respondents (10%) reported using different names on Twitter, 33% of whom (n = 5) were female. Six of 149 respondents indicated that they use a different last name in personal versus professional life, and most (n = 5) were female.

Characteristics of social media and digital resource use

The 5 most commonly used SM platforms were Facebook (73%), theMednet (62%), Instagram (59%), Twitter (59%), and Doximity (50%; Fig. 1). Table 1 summarizes the most common sources of information consulted for advice or opinions about a case. The top source was direct work colleagues, followed by theMednet. The most common e-mail subscriptions by respondents included QuadShotNews and theMednet (Table 1). Supplement A includes other write-in answers. A large proportion of respondents (48%) indicated that they have participated in RO-related discussions on SM and 54% have used online forums to communicate with others within the RO community. Approximately one-quarter have used SM to identify and communicate with a RO mentor. A larger percentage (39%) are connected to a current RO mentor on any SM platform. Approximately 40% of residents indicated that their institution had a SM policy. Of this group, a sizeable percentage (44.1%) reported that they had read the policy. Additional details of SM use are found in Table 1.

Time on social media

When asked to quantify time spent on SM over the past week, the most common answer was between 30 minutes and 1 hour (Table 1). The percentage of overall time spent on SM toward professional or academic purposes is depicted in Figure 2. The majority of respondents spend less than a quarter of their overall SM time on professional/academic purposes. A small proportion reported they did not spend any of their SM time on professional or academic purposes. Figure 3 demonstrates the most common times when SM is used.

Perceptions about social media

Figure 4 demonstrates respondents' thoughts about different aspects of SM. A large majority of respondents felt that SM exposes them to educational material that they might not have otherwise come across in a traditional RO curriculum. In addition, 65% of residents felt that SM could be helpful for career development. A total of 69% felt that SM can improve clinical skills and knowledge in cancer care. And 42% agreed that SM enhances the feeling of belonging to a RO community. When asked whether they found the amount of material presented on SM overwhelming, 24% agreed.

Moreover, 29% of respondents agreed that they felt pressured to use SM for professional purposes. A large proportion (38%) agreed that SM distracts from them from studying, and 12% agreed that SM distracts them from patient care. Only 16% of respondents agreed that SM blurred boundaries with attending physicians at their training institution, whereas 59% disagreed with that statement. Also, 23% agreed that SM makes setting boundaries between professional and private life challenging. When asked about anonymous platforms, 22% agreed they present accurate information about the field of RO, whereas 51% disagreed with this statement. A substantial minority (34%) agreed that SM platforms in which users are mostly anonymous allowed them to discuss residency-related topics and issues in a safe environment.

The results of the univariate analysis are summarized in Table 2. Factors associated with agreeing that SM exposes one to novel educational content include spending a greater percentage of SM time on professional activities, finding a mentor on SM, and participating in RO discussions on SM. As seen in Table 2, similar factors were associated with agreeing that SM enhances feelings of belonging to the RO community and that SM can

Table 1 Characteristics of responding radiation oncology trainees and social media/digital resource use

Characteristic	n (%)
Geographic region	
Northeast	32 (21.5)
Midwest	37 (24.8)
South	54 (36.2)
West	26 (17.5)
Sex	
Male	86 (57.7)
Female	61 (41.0)
Prefer not to specify	2 (1.3)
Age	
21-29 y	34 (22.8)
30-39 y	111 (74.5)
40-49 y	4 (2.7)
Marital status	
Married/domestically partnered	86 (58.1)
Single, divorced	4 (2.7)
Single, never married	57 (38.5)
Widowed	1 (0.7)
When looking for advice/opinions about a case, most useful information found from:	
My direct work colleagues	87 (59.1)
My colleagues at another institution	3 (2.0)
Facebook	3 (2.0)
Twitter	3 (2.0)
Student Doctor Network	5 (3.4)
theMednet	46 (30.9)
Instagram	1 (0.6)
E-mails subscriptions (check all that apply)	
QuadShotNews	115 (77)
theMednet	101 (68)
International Journal of Radiation Oncology Biology Physics	48 (32)
American College of Radiology Journal Advisor	37 (25)
Practical Radiation Oncology	28 (19)
Advances in Radiation Oncology	14 (10)
Participated in radiation oncology related discussions on social media	
Yes	71 (47.7)
No	78 (52.4)
Used online forums to communicate with others within radiation oncology community	
Yes	81 (54.4)
No	68 (45.6)
Used social media to identify and communicate with a radiation oncology mentor	
Yes	35 (23.5)
No	114 (76.5)
Connected to a current radiation oncology mentor on any social media platform	
Yes	58 (38.9)
No	87 (58.4)
Do not know	4 (2.7)
Interactions on social media (check all that apply)	
Radiation oncology resident/fellows	112 (75)
Radiation oncology attendings (known in real life)	87 (58)
Radiation oncology attendings (not known in real life)	76 (51)
Professional societies (eg, American Society for Radiation Oncology, American Society of Clinical Oncology, Radiological Society of North America)	69 (46)
Other cancer professionals	64 (43)
Noncancer health professionals	48 (32)
Medical journals	37 (25)
Health care delivery organizations	24 (16)
Cancer advocates	19 (13)
Radiation oncology industry companies	12 (8)
Patients	6 (4)
None of the above	27 (18)
Institution or workplace has implemented a policy on social media use	
Yes, and I have read it	26 (17.5)
Yes, but I have not read it	33 (22.0)
No	35 (23.5)
I do not know	55 (37.0)
Time spent on social media over the past week	
None	7 (5)
<15 minutes per day	28 (19)
≥15 minutes to <30 minutes per day	41 (28)
≥30 minutes to <1 hour	42 (28)
≥1 hour to <3 hours	28 (19)
≥3 hours	3 (2)

(*continued on next colnum*)

improve clinical skills and knowledge in cancer care. Residents who found a RO mentor through SM, those who participated in RO discussions on SM, and those who interacted with professional societies were more likely to spend >25% of their SM time for professional and academic purposes.

Men were less likely than women to agree that SM distracts from studying. Those respondents spending >1

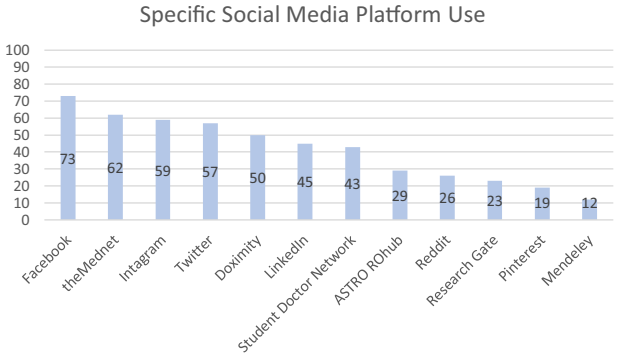

Figure 1 Prevalence of social media platform use by radiation oncology residents for any use within the past month.

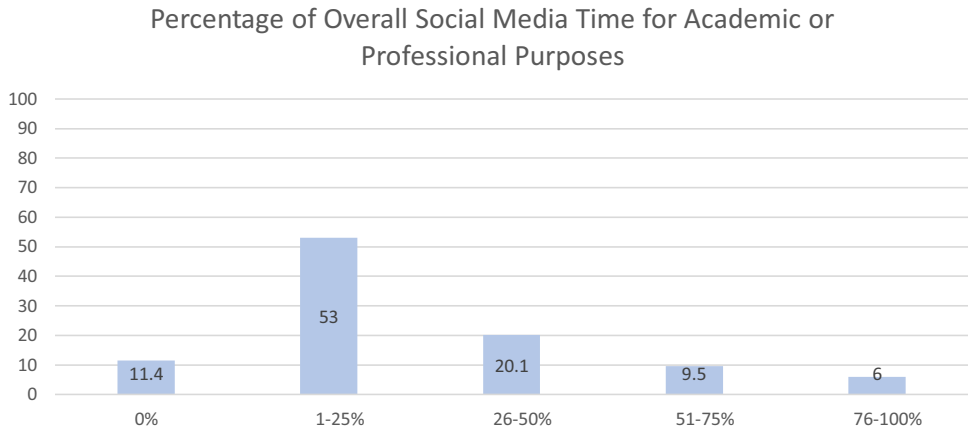

Figure 2 Prevalence of radiation oncology resident social media use for academic or professional purposes.

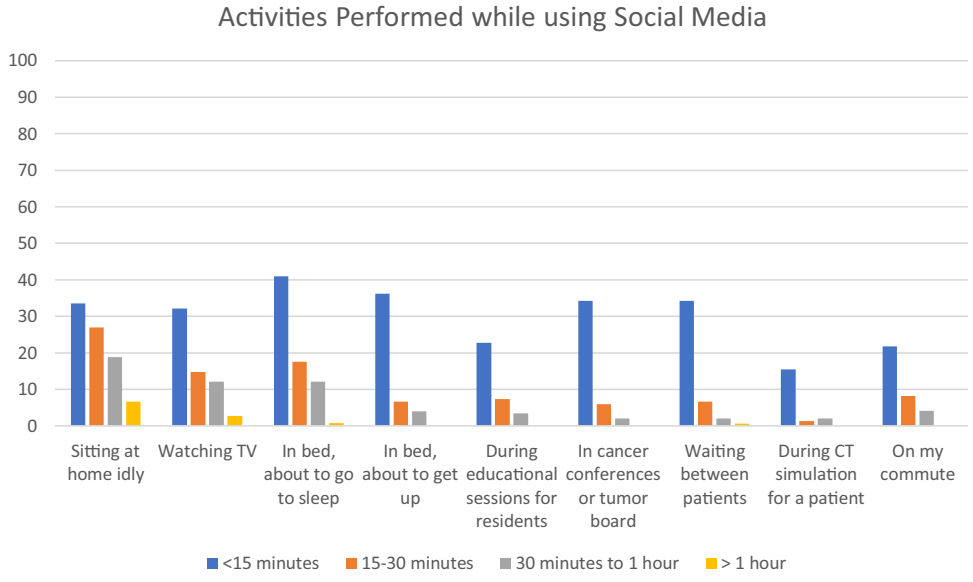

Figure 3 Categories of activities radiation oncology residents perform during which they report social media use. The y-axis represents percent of respondents. Response of none not included.

hour per day on SM were also more likely to find SM distracting. There was no association with a greater percentage of overall SM time spent on professional and academic purposes with finding SM distracting. Respondents interacting with professional societies on SM were more likely to feel pressure to have a SM presence. Men were less likely than women to feel pressure.

Discussion

The results of this survey detail perceptions surrounding the potential advantages and disadvantages of various SM platforms as tools during residency training, and highlight areas for further research. Our findings indicate that one of the greatest perceived benefits of SM for responding RO trainees is the ability to provide information not otherwise found in a traditional residency curriculum.

In a systematic review of SM use in medical resident education, Sterling et al. found that Twitter, podcasts, and blogs were the most frequently used platforms.[1] In the current study, we found that traditional SM platforms, such as Twitter and Facebook, may be of less value for the specific purpose of obtaining advice about a case compared with theMednet, an online discussion forum that allows verified physician users to both post and answer oncology-related questions.[12] Additionally, violations of the Health Insurance Portability and Accountability Act of 1996 may be a potential risk of trainee use of SM to obtain medical information and may limit the utility of SM for such purposes.[13] Therefore, more structured online discussion forums may help mitigate some of these potential risks while still providing the benefits of increased connectivity and

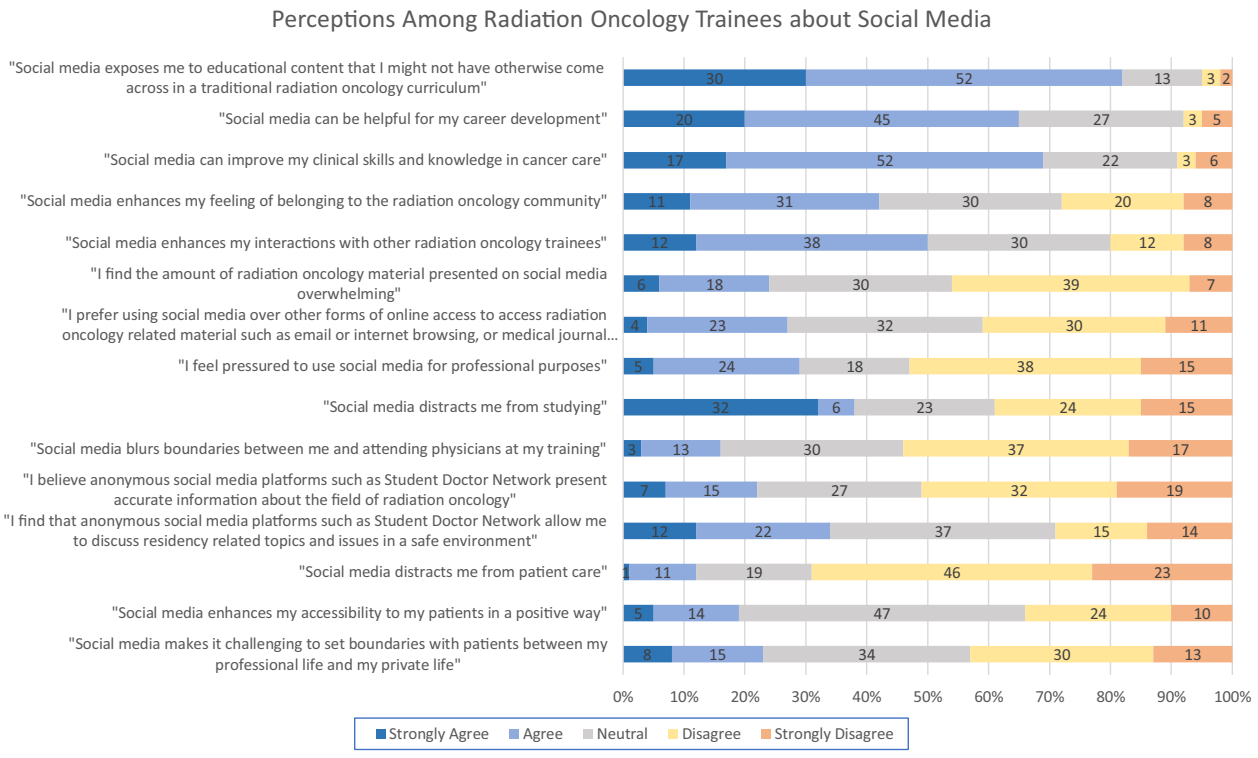

Figure 4 Resident perceptions of social media. Questions were answered with an interval 5-point scale from strongly agree to strongly disagree.

access to information outside of the traditional curriculum.

SM platforms also allow for the creation of virtual communities that may facilitate professional networking, knowledge sharing, and evidence-informed practice for physicians.[14] In an online survey, Graff et al. found that a closed Facebook group for female hematologists/oncologists improved career satisfaction and professional burnout.[15] Furthermore, staying connected with colleagues and networking with the wider community have been shown to be primary motivations for physicians joining SM.[16] Similarly, connectivity with other professionals appears to be a motivation for SM use among RO residents based on the current study findings, and SM could be increasingly leveraged by residents to seek out and remain connected with a mentor in RO by increasing access to mentors outside of their own institution.

A small proportion of respondents reported using separate names in their personal and professional lives with specific use of separate names on Facebook and Twitter. The use of different names may be in part due to a desire to construct stricter boundaries between professional and personal use of SM. A small portion agreed that SM makes setting boundaries between professional and private life challenging, and this perceived challenge may be in part due to knowledge about online professionalism issues as well as a desire for privacy.

Despite the advantages of SM, various aspects of SM may present challenges to the learning process when used as an educational tool.[9,17,18] SM users may encounter an even greater amount of distractors, including live feeds, video clips, and user comments, which diminish their ability to retain information encountered. How best to balance or integrate traditional and digital learning is currently unknown. Our survey indicates that e-mail subscriptions to specialty-specific information and online forums may also complement knowledge obtained in residency training and may be preferred to some of the distracting features of SM.

A substantial minority agreed that anonymous platforms may allow them to discuss residency-related topics and issues in a safe environment. Given the sensitivity of issues of concern for RO residents, including board pass rates and potential difficulty obtaining desirable employment after graduation, anonymity may play a role in the ability of residents to discuss such topics in the future, and those involved in resident education and advocacy may continue to aid residents by staying attuned to recurring themes presented on anonymous platforms.[19]

Finally, we observed that almost one-third of residents reported feeling pressure to have a SM presence for professional purposes. Factors associated with this feeling included female sex and interacting with professional societies on SM. Undue pressure to maintain a SM presence among residents is of concern because this could potentially detract from the perceived sense of agency residents have when making personal decisions regarding their use of SM.

Table 2 Univariate logistic regression

	Odds ratio for agree/strongly agree with select statements					Odds ratio for >25% of social media time on professional/ academic activities
	"Social media enhances my feeling of belonging to the radiation oncology community"	"Social media can improve my clinical skills and knowledge in cancer care"	"Social media exposes me to educational content that I might not have otherwise come across in a traditional radiation oncology curriculum"	"Social media distracts me from studying"	"I feel pressured to use social media for professional purposes"	N/A
Age group: 30+ vs <30 y	1.24; $P = .587$ (0.57-2.72)	0.91; $P = .834$ (0.40-2.11)	0.73; $P = .557$ (0.25-2.10)	0.96; $P = .929$ (0.44-2.12)	0.68; $P = .347$ (0.30-1.53)	1.20; $P = .656$ (0.53-2.71)
Male vs female	0.55; $P = .073$ (0.28-1.06)	0.94; $P = .872$ (0.47-1.91)	0.93; $P = .858$ (0.40-2.16)	**0.38; $P = .005$** (0.19-0.74)	**0.40; $P = .014$** (0.19-0.83)	0.93; $P = .838$ (0.47-1.84)
Unmarried vs married	0.89; $P = .743$ (0.46-1.74)	0.80; $P = .534$ (0.40-1.62)	**0.35; $P = .017$** (0.15-0.83)	1.80; $P = .089$ (0.91-3.54)	1.21; $P = .604$ (0.59-2.49)	1.10; $P = .782$ (0.56-2.17)
Twitter vs Facebook	**0.31; $P = .024$** (0.12-0.86)	0.27; $P = .057$ (0.07-1.04)	0.17; $P = .108$ (0.02-1.47)	1.64; $P = .340$ (0.59-4.57)	2.42; $P = .111$ (0.82-7.19)	**0.12; $P < .001$** (0.04-0.35)
Time spent on social for professional activities						
1T-25% vs 0%	4.12; $P = .073$ (0.88-19.32)	**4.62; $P = .009$** (1.48-14.48)	**4.80; $P = .005$** (1.59-14.51)	1.08; $P = .888$ (0.37-3.13)	1.25; $P = .717$ (0.37-4.27)	N/A
26%-50% vs 0%	**12.95; $P = .002$** (2.48-67.57)	**21.60; $P < .001$** (4.43-105.36)	**32.62; $P = .002$** (3.58-297.19)	0.61; $P = .439$ (0.18-2.12)	0.99; $P = .988$ (0.24-4.03)	N/A
>50% vs 0%	**11.67; $P = .005$** (2.14-63.64)	**11.40; $P = .001$** (2.54-51.11)	**11.81; $P = .005$** (2.08-66.97)	0.50; $P = .317$ (0.13-1.93)	2.50; $P = .197$ (0.62-10.05)	N/A
Met mentor on social media vs not	**11.37; $P < .001$** (4.33-29.89)	**3.37; $P = .020$** (1.21-9.36)	**4.63; $P = .044$** (1.04-20.66)	1.82; $P = .128$ (0.84-3.91)	1.65; $P = .219$ (0.74-3.69)	**2.79; $P = .010$** (1.29-6.08)
Currently connected with mentor vs not	**2.68; $P = .004$** (1.36-5.29)	1.70; $P = .157$ (0.81-3.57)	**2.60; $P = .055$** (0.98-6.90)	1.30; $P = .445$ (0.66-2.56)	1.56; $P = .228$ (0.76-3.19)	1.93; $P = .061$ (0.97-3.82)
Time spent on social media per day						
15-30 min vs <15 min or none	1.66; $P = .355$ (0.57-4.81)	**4.74; $P = .002$** (1.75-12.85)	**7.79; $P = .001$** (2.28-26.58)	**2.83; $P = .049$** (1.01-7.98)	1.57; $P = .391$ (0.56-4.38)	1.13; $P = .802$ (0.43-2.96)
30 min-1 h vs <15 min or none	**4.40; $P = .005$** (1.58-12.28)	**2.97; $P = .022$** (1.17-7.58)	**6.23; $P = .002$** (1.98-19.61)	**3.00; $P = .036$** (1.07-8.40)	1.20; $P = .736$ (0.42-3.41)	1.09; $P = .859$ (0.42-2.85)
>1 h vs <15 min or none	**9.78; $P < .001$** (3.14-30.41)	**9.00; $P = .001$** (2.59-31.27)	**12.21; $P = .002$** (2.52-59.26)	**3.29; $P = .032$** (1.11-9.79)	1.86; $P = .261$ (0.63-5.46)	1.80; $P = .253$ (0.66-4.91)
Participated in RO discussion on social vs not	**5.06; $P < .001$** (2.50-10.24)	**2.83; $P = .006$** (1.35-5.93)	**2.54; $P = .043$** (1.03-6.23)	1.16; $P = .656$ (0.60-2.26)	1.07; $P = .854$ (0.53-2.17)	**2.85; $P = .003$** (1.42-5.72)

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Table 2 (*continued*)

	Odds ratio for agree/strongly agree with select statements					Odds ratio for >25% of social media time on professional/ academic activities
	"Social media enhances my feeling of belonging to the radiation oncology community"	"Social media can improve my clinical skills and knowledge in cancer care"	"Social media exposes me to educational content that I might not have otherwise come across in a traditional radiation oncology curriculum"	"Social media distracts me from studying"	"I feel pressured to use social media for professional purposes"	N/A
Interacted with RO residents on social vs not	**4.29; $P = .002$** (1.74-10.56)	**3.89; $P = .001$** (1.78-8.50)	**5.68; $P < .001$** (2.34-13.81)	**3.33; $P = .009$** (1.35-8.23)	0.95; $P = .893$ (0.42-2.14)	**2.99; $P = .018$** (1.21-7.38)
Interacted with RO out of training but never met vs not	**7.65; $P < .001$** (3.62-16.17)	**4.00; $P < .001$** (1.88-8.50)	**8.28; $P < .001$** (2.70-25.41)	1.18; $P = .627$ (0.61-2.29)	1.31; $P = .455$ (0.64-2.67)	**4.44; $P < .001$** (2.13-9.27)
Interacted with RO out of training and know vs not	**2.97; $P = .002$** (1.48-5.97)	**2.76; $P = .005$** (1.35-5.64)	**3.55; $P = .005$** (1.47-8.56)	1.67; $P = .141$ (0.84-3.33)	1.49; $P = .290$ (0.71-3.10)	**2.13; $P = .037$** (1.05-4.33)
Interacted with professional societies vs not	**6.46; $P < .001$** (3.14-13.29)	**4.83; $P < .001$** (2.16-10.77)	**15.23; $P < .001$** (3.45-67.15)	1.13; $P = .717$ (0.58-2.20)	**2.57; $P = .011$** (1.24-5.34)	**7.11; $P < .001$** (3.32-15.24)
Interacted with other cancer professionals vs not	**3.51; $P < .001$** (1.77-6.94)	**3.37; $P = .002$** (1.55-7.36)	**5.56; $P = .003$** (1.82-17.05)	1.12; $P = .746$ (0.57-2.18)	1.23; $P = .576$ (0.60-2.50)	**3.46; $P = .001$** (1.72-6.97)

Abbreviations: N/A, not applicable; *RO*, radiation oncology.
P-values $\leq .05$ are shown in bold.

This study has limitations inherent to any self-reported questionnaire, including potential recall bias, social desirability bias, and bias related to no responses. The latter is especially important given the relatively modest response rate. Those who responded to the survey may have been particularly interested in or engaged in SM, given that we solicited responses partly by advertising on SM sites, potentially limiting the generalizability of our findings to the broader population of RO residents overall. Furthermore, we did not collect data related to post-graduate year, and SM use could potentially differ based on year of training. Finally, the definition of SM may vary between users with some platforms falling into the classification of traditional SM whereas the classification of other social networking sites and online platforms may not be as clear. Despite these limitations, we believe this study offers important insights into the potential value SM may hold for RO trainees.

Conclusions

With this survey, we found that many RO residents find SM to have value for education and professional endeavors, and particularly the ability to use SM to access novel material not present in a traditional educational curriculum and for professional networking. Potential disadvantages of SM for trainees include distraction from studying and pressure to maintain a professional SM presence. SM use by RO trainees deserves further research to define effective use for learning and professional development.

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Supplementary Materials

Supplementary material for this article can be found at https://doi.org/10.1016/j.adro.2020.100642.

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