

ONLINE FIRST PUBLICATION

Online first papers have undergone full scientific review and copyediting, but have not been typeset or proofread. To cite this article, use the DOI number provided. Mandatory typesetting and proofreading will commence with regular print and online publication of the online first papers of the *SMJ*.

Doctors and social media: knowledge gaps and unsafe practices

Jia Ming Low¹, MBBS, MMed, Mae Yue Tan¹, MBBS, MMed,
Roy Joseph,^{1,2,3} MMed, FRCPCH

¹Khoo Teck Puat-National University Children's Medical Institute, National University Health System, ²Centre for Biomedical Ethics, ³Department of Paediatrics, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Correspondence: A/Prof Roy Joseph, Senior Consultant, Department of Paediatrics, Yong Loo Lin School of Medicine, National University of Singapore, Department of Paediatrics, NUHS Tower Block, Level 12, 1E Kent Ridge Road, Singapore 119228. paeroyj@nus.edu.sg

Singapore Med J 2020, 1–14

<https://doi.org/10.11622/smedj.2020067>

Published ahead of print: 21 April 2020

Online version can be found at
<http://www.smj.org.sg/online-first>

ABSTRACT

Introduction: Easy access and availability of communication tools has facilitated doctors' communication, adding challenges. We aimed to determine the profile of the knowledge and practices of doctors in our institution, and to identify knowledge gaps in the use of social media accounts.

Methods: An anonymous survey was sent out by electronic mail from March to May 2018 to 931 doctors working in National University Hospital, Singapore. It included questions on demographics, use of social media, and case-based scenarios involving professionalism, patient-doctor relationship and personal practices of social media use.

Results: The response rate was 13%. The majority owned a social media account (93%), did not receive education on social media use in medical school (84%), did not own a separate work phone (80%), and claimed to have no medical education on this as a doctor (59%). Unawareness of the institution's social media policy was reported by 14%. Incorrect answers were given for questions on knowledge of the privacy settings of their account. Only 75%–82% responded 'no' when asked if they would post pictures of patients or their results, even if there were no patient identifiers.

Conclusion: Knowledge of institutional social media policy and privacy settings of social media accounts is inadequate among doctors. Regarding practices in social media use, while most agree that caution should be exercised for online posts involving patients, ambiguity still exists. The emerging knowledge deficit and potentially unsafe practices that are identified can be addressed through continuing medical education and training on social media use.

Keywords: education, Singapore, survey, tertiary hospital, training

INTRODUCTION

Social media is described by Kaplan and Haenlein⁽¹⁾ as “*a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content*”. Internet-based applications refer to the different categories of social media, i.e. blogs, content communities, social networking sites, collaborative projects, virtual game worlds and virtual social worlds. The use of social media has drastically increased over the last few years, with over 2 billion active Facebook users and an estimate of more than 300 million active users of Twitter.⁽²⁾

Awareness of social media and its use in healthcare has become more established in recent years. Easy access and availability of communication tools has allowed doctors to communicate within and outside of their practice more efficiently. While this has created more opportunities for collaboration, it is not without its challenges. Social media has made it more difficult for physicians to maintain a clear line between their professional and personal lives. Healthcare workers have been disciplined for inappropriate online postings.⁽³⁾

The Singapore Medical Council (SMC) has produced new guidelines on social media use for medical professionals under the updated SMC Ethical Code and Ethical Guidelines (ECEG), which took effect on January 2017. There are clearly things that doctors should not do, both online and offline. The ECEG comes with examples listing the entire range of possible inappropriate behaviour on social media, such as appearing intoxicated, engaging in lewd or inappropriate behaviour, posting personal or derogatory comments about patients or colleagues, to name a few.⁽⁴⁾

We sought to study the prevalence of social media use, describe the current profile on knowledge and practices of doctors in our institution regarding the use of social media. We focused on the use of social media accounts such as Facebook, Twitter and Instagram, and also the use of instant message applications such as WhatsApp and Snapchat.

The primary aim of this cross-sectional study was to highlight the current social media climate among doctors working in a tertiary unit in Singapore in order to gain a better understanding of the current knowledge and practices of this group of doctors. This would in turn help to identify gaps in terms of proper use of social media. This knowledge would shape the planning and implementation of educational curriculum for our doctors in the use of social media as social media use becomes more ubiquitous within healthcare practice.

METHODS

Our study design was a cross-sectional survey. An online voluntary anonymous survey was sent out via electronic mail to 931 practicing doctors working in National University Hospital, Singapore. The survey was disseminated through the work email accounts of department secretaries to the doctors' work email, with one reminder email sent at fortnightly intervals. The study period was from 1 March 2018 to 31 May 2018. The results of the survey were compiled via Google Forms, an online survey tool.

It was emphasised at the start of the survey that a doctor's refusal to participate in the study had no bearing on his or her clinical work or assessments and that the study was solely for research purposes. Implied consent to use the data provided to the study team was assumed when a doctor completed the survey. Doctors were also given the option to skip questions that they were not comfortable with answering or abort the survey completely. The study was reviewed and approved by the National Healthcare Group Domain Specific Review Board (study reference number 2018/00094).

The survey contained questions pertaining to doctors' knowledge of their social media account privacy settings. This included case-based scenarios involving professionalism, patient-doctor relationship, and personal practices of social media use to understand their social media practices. It also contained questions that assess their engagement in social media and

privacy concerns using a 3-point Likert scale. As there was no available validated scale assessing social media use, this survey was developed after the questions were deliberated among the investigators and after a preliminary survey was conducted to collect feedback from doctors regarding their concerns about social media use. These questions were chosen to reflect the breadth of possible uses, and framed in the context of personal and professional usages. Prior to the survey being sent out, it was piloted to check for ease of use and readability.

We decided that a knowledge gap in more than 20% of the population is of practical significance. Hence, we calculated that approximately 106 participants would be needed for this study in order to demonstrate a 20% difference based on a two-sided significance alpha level of 5% and 80% power. Descriptive statistics such as personal demographics, including age, gender, duration of practice, work designation, specialty of practice, were obtained. Chi-square test was used to compare the responses between different demographic categories using IBM SPSS Statistics version 23.0 (IBM Corp, Armonk, NY, USA), and the statistical significance was set at $p < 0.05$.

RESULTS

A total of 931 invitations to participate in the survey were sent out, of which 119 (12.8%) surveys were completed and returned. Table I shows the demographic details of the participants. Only one in five respondents (19.3%) had a separate phone for work-related matters. There was no correlation between age groups and keeping a separate phone ($p = 0.157$). The majority owned a social media account 111 (93.3%) and used an image messaging application 114 (95.8%). Doctors aged ≥ 45 years formed the majority of those who do not own a social media account (75.0% vs. 10.8%, $p < 0.01$). 17.1% of participants have three or more active accounts, and 97.3% have been using their accounts for more than a year (Table II).

Table I. Demographic details of the study participants (n = 119).

Demographics	No. (%)
Gender	
Male	61 (51.3)
Female	58 (48.7)
Age (yr)	
≤ 25	6 (5.0)
26–35	69 (58.0)
36–45	26 (21.8)
> 45	18 (15.1)
Designation at work	
House Officer	5 (4.2)
Medical Officer	34 (28.6)
Registrar	31 (26.1)
Resident Physician	6 (5.0)
Associate Consultant	11 (9.2)
Consultant	17 (14.3)
Senior Consultant	15 (12.6)
Years in practice	
< 5	27 (22.7)
5–10	51 (42.9)
> 10	41 (34.4)
Medical school	
Undergraduate - local	69 (58.0)
Undergraduate - overseas	26 (21.8)
Postgraduate - local	7 (5.9)
Postgraduate - overseas	17 (14.3)
Department	
Surgical-based specialties (n = 20; 16.8%)	
<i>General Surgery</i>	3 (15.0)
<i>Obstetrics/Gynaecology</i>	3 (15.0)
<i>Ophthalmology</i>	2 (10.0)
<i>Orthopaedics</i>	12 (60.0)
Medical-based specialties (n = 86; 72.3%)	
<i>Anaesthesia</i>	3 (3.5)
<i>Diagnostic Imaging</i>	2 (2.3)
<i>Emergency Medicine</i>	18 (21.0)
<i>Family Medicine</i>	8 (9.3)
<i>Internal Medicine</i>	34 (39.5)
<i>Paediatrics</i>	19 (22.1)
<i>Undifferentiated (Medical)</i>	2 (2.3)
Others (n = 13; 10.9%)	
<i>Dentistry</i>	7 (53.8)
<i>Laboratory Medicine</i>	2 (15.4)
<i>Pathology</i>	2 (15.4)
<i>Public Health</i>	2 (15.4)

Table II. Use of online social media accounts (n = 119).

Category	No. (%)
Do you have a separate phone for work-related matters?*	
Yes	23 (19.3)
No	96 (80.7)
Do you currently have a social media account (Facebook, Twitter, Instagram) for your own use?†	
Yes	111 (93.3)
No	8 (6.7)
Do you currently use an instant message application (Whatsapp, Snapchat) for your own use?	
Yes	114 (95.8)
No	5 (4.2)
If you have a social media account (n = 111)	
How long have you been actively using a social media account?	
< 6 mth	2 (1.8)
6–12 mth	1 (0.9)
> 12 mth	108 (97.3)
How many active social media account(s) do you have?	
1	52 (46.9)
2	40 (36.0)
≥ 3	19 (17.1)

*There was no correlation between age groups and keeping a separate phone ($p = 0.157$).

†Doctors aged ≥ 45 years formed the majority who do not own a social media account (75.0% vs. 10.8%, $p < 0.01$).

Most doctors (85.7%) claimed that they were aware that the institution had a social media policy. However, a large number (84.0%) reported that they had not received education on the use of social media in medical school. More of those who graduated from an overseas undergraduate programme reported having education on social media use as compared to those who graduated from a local medical school (42.1% vs. 18.0%, $p = 0.032$). More than half of the cohort (58.8%) denied having received any continuing medical education or instructions on social media use in their postgraduate years (Fig. 1).

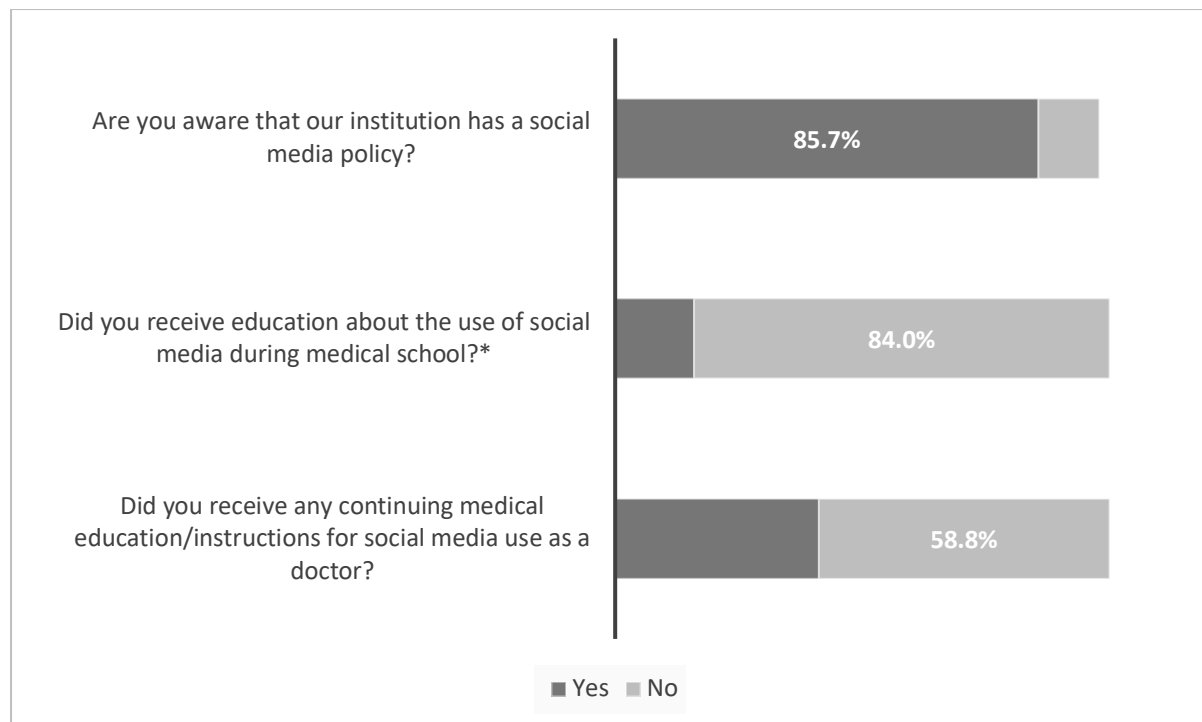


Fig 1. Knowledge of social media policy/education. *Those who graduated from an overseas undergraduate programme reported having education on social media use vs. those who graduated from local medical schools (42.1% vs. 18.0%, $p = 0.032$).

Of those who owned a social media account ($n = 111$), 95.5% and 77.2% of them claimed that they understood the settings of their social media account and instant messaging application, respectively. However, when specific questions were posed to test their knowledge of social media account settings, heterogeneous answers were given. Only 66.7% knew that they could prevent a person/patient from searching for their social media profile. Also, 38.7% responded incorrectly that anyone can search for them on their social media account regardless of privacy setting. While most (86.5%) knew that it is possible to change settings to control who can tag them on a photo/image, a small number of participants (13.5%) did not think this is possible; those who were aged ≤ 35 years answered this question correctly (91.9% vs. 75.7%, $p = 0.035$). Approximately half (55.0%) responded incorrectly that they can permanently delete a post or other material they have posted on their social media account (Table III). Two-thirds

(67.5%) of those who use an instant messaging application (n = 114) reported sending patient data via instant messaging to their colleagues. About half (57.0%) would remove patient identifiers prior to sending the results, while 65.8% would take photographs of patients using their phone (Table IV).

Table III. Knowledge of social media account privacy settings (n = 111).

Questions on privacy	No. (%)	
	Yes	No
Do you know the current privacy setting of your account?	106 (95.5)	5 (4.5)
Can you prevent a person/patient from searching for your social media profile?	74 (66.7)	37 (33.3)
Can anyone search for you on your social media account regardless of privacy setting?	68 (61.3)	43 (38.7)
Is it possible to change settings to control who can tag you on a photo or image?*	96 (86.5)	15 (13.5)
I can permanently delete a post or other material I have posted to my social media account.	61 (55.0)	50 (45.0)

*91.9% of those aged ≤ 35 years answered correctly (i.e. "Yes, it is possible to change settings to control who can tag you on a photo or image") compared to 75.7%, $p = 0.035$.

Table IV. Practices in the use of instant messaging application (n = 114).

Question	No. (%)
How often do you send patient's results through your image messaging application?	
Not at all	37 (32.5)
Sometimes	52 (45.6)
Often	15 (13.2)
All the time	10 (8.7)
Do you de-identify these patients?	
Yes	65 (57.0)
No	15 (13.2)
NA (I do not send results)	34 (29.8)
How often do you take photographs of your patients with your phone?	
Not at all	39 (34.2)
Sometimes	57 (50.0)
Often	9 (7.9)
All the time	9 (7.9)

Regarding social media use, 75.6% and 82.4% of the cohort felt it was unacceptable to post photos and radiological imaging of patients on their social media account, respectively.

78.2% would not accept a friend request from a patient. One in five (22.7%) felt that it was acceptable to access their social media account while on duty, while 52.1% disagreed and 25.2% were uncertain if this was appropriate. 60.5% felt it was inappropriate to post work victories on their social media account, while 39.5% would consider doing it. In terms of collegiality, 70.6% felt that it was professionally acceptable to post a photo with colleagues at a department event on their social media account. About one-third (37.8%) felt it was acceptable to post a photo of colleagues drinking alcoholic beverages at a social event (Table V).

Table V. Practices in social media use in specific scenarios (n = 119).

Case-based scenarios on social media use	No. (%)
Patient-doctor relationship	
Your patient has a very interesting rash on the back. You take a picture of this rash for the chart. There is no way to identify the patient from the picture. You think it would be highly educational to share this finding with your colleagues. Is it okay to post the picture to your social media account?	
Yes	2 (1.7)
No	90 (75.6)
Maybe	27 (22.7)
You are reviewing an interesting CT of a patient. There is no identifying information about the patient on this diagnostic image. You decide to post the image on social media. Is it okay to post the picture to your social media account?	
Yes	6 (5.0)
No	98 (82.4)
Maybe	15 (12.6)
You receive a 'friend' request on Facebook (or similar request on a different social media platform) from a patient. Is it okay to accept this 'friend' request?	
Yes	7 (5.9)
No	93 (78.2)
Maybe	19 (15.9)
Personal use of social media	
While on duty in the hospital, you are in a patient care area. Your patient(s) is stable and does not require intervention. You are immediately available should your patient require assistance of any kind. Is it professionally acceptable to access your social media account while on duty?	
Yes	27 (22.7)
No	62 (52.1)
Maybe	30 (25.2)

You take your patient from the mass casualty event to the OR for a severe penetrating injury. After successfully participating in the care of this patient, you post the following statement to your social media account, “Wow – crazy day! Took a young boy to the operating room for nasty fracture. He’s doing great. I love my job.” Is this acceptable as a medical professional?	
Yes	20 (16.8)
No	72 (60.5)
Maybe	27 (22.7)
Collegiality	
You attend a departmental event and your colleagues pose for a group photo. They all agree to have their picture posted online. Is it professionally acceptable to post this on your social media page to help promote the programme?	
Yes	84 (70.6)
No	12 (10.1)
Maybe	23 (19.3)
You participate in a ‘night-out’ with your colleagues. You snap a picture of a group in which some of your colleagues are drinking alcoholic beverages. You want to post this to your social media account. Is this acceptable as a medical professional?	
Yes	45 (37.8)
No	46 (38.7)
Maybe	28 (23.5)

CT: computed tomography; OR: operating room

DISCUSSION

Not surprisingly, 95%–97% of doctors in our institution owns a social media account, which is similar or slightly higher than the proportion reported in other studies.⁽⁵⁾ Other studies have shown that the use of social media was less prevalent among older doctors and most social media users were under the age of 30 years.⁽⁶⁾ In our study, the majority of those who do not own a social media account comprised doctors aged 45 years or older (75.0% vs. 10.8%, $p < 0.01$).

Our results suggest that there is a knowledge deficit in terms of understanding of the privacy settings of social media accounts. When asked specific questions about this, 30.0%–55.0% of the respondents had an incorrect understanding of their social media account settings despite 95.5% claiming that they were aware. This knowledge is important to avoid privacy breach of confidential information, especially if these doctors post material online about their

patients. This lack of knowledge of social media privacy settings mirrors that of other studies that were conducted in medical professionals whose patients' privacy was violated due to unawareness of ethical implications.⁽⁷⁻⁹⁾ Being unaware of privacy settings could also allow patients to search for doctors online and access their personal information. A previous study showed that most doctors were not comfortable with a patient who had accessed information about them online prior to the consultation.⁽⁵⁾ Understanding privacy settings is also important to ensure that content for private access does not become public, and this is one of the key guidelines proposed by Guseh et al.⁽¹⁰⁾ Similarly, most doctors would not be comfortable accepting a 'friend' request from their patients. This practice is consistent with that reported in other studies.^(5,10)

Although guidelines on social media use can be found in the SMC ECEG, our study found that there is much heterogeneity in social media knowledge among the doctors surveyed. The majority (84.0%) claimed not to have received education on social media use in medical school. As the doctors surveyed had already been working for 5–10 years, the lack of education on social media use might reflect a lower emphasis on social media in the past. A significant number (58.8%) also did not receive education on this important topic during their postgraduate training.

In the case-based scenarios, we identified considerable ambivalence among doctors regarding their social media practices. Although some doctors would post online material related to work, most agree that they need to exercise caution, especially if there is patient involvement. This study raises the important questions related to the appropriate use of social media in our local healthcare settings amidst an increasingly litigious society. Although there are official general guidelines available to address these questions, in practice, it is impossible to formulate similar guidelines for all possible usage scenarios given the broad application areas and involved stakeholders.

We have noticed a trend that favours social media use for medical education purposes (e.g. posting a de-identified picture of a rash for educational purposes). Social media use in medical education has shown some promise in promoting learning among junior doctors due to its ease of use and fast communication of information.⁽¹¹⁾ However, its use in medical education worldwide remains challenging due to concerns about medical professionalism.⁽¹²⁾

Indeed, the use of social media by doctors remains ambivalent. We speculate that this may be due to concerns about liability, litigation and privacy. However, it is undeniable that opportunities for doctors to use these vast social networks to improve healthcare efficacy and the wellbeing of patients are present. Perhaps, instead of complete abstinence, the best way forward is to stay abreast of the changing privacy settings of social media sites so that users can protect their private information. We propose continuing medical education to fill this knowledge gap and equip our doctors to better deal with social media use, which is likely to be increasingly integrated into medical practice. We recognise that there may not be clear answers for some of the questions posed, but case-based discussions/interactive sessions in small group settings could be useful.

There are limitations to our study that merit consideration. This is a single centre survey, and the response rate raises the potential for acquisition bias. The response rate of 12.8% may not be reflective of the rest of the population of doctors; as we do not know the views of the non-responder, the potential for non-response bias exists. Furthermore, the survey was done online, which might have resulted in a biased cohort that favours technology.

In conclusion, this cross-sectional survey provides a description of the current knowledge and practices regarding the use of social media by doctors working in a tertiary hospital in Singapore. It underlines the ongoing need to improve doctors' online knowledge and capabilities, refine guidelines and continuing medical education, and increase awareness on this matter, as social media will continue to be increasingly ubiquitous and integrated in

healthcare. In view of the potential for severe professional repercussions, we propose that all medical professionals who use social media must have no or minimal gaps in knowledge or ambivalence in both personal and professional social media practices.

ACKNOWLEDGEMENTS

We thank Dr Dimple Rajgor for her assistance in editing, formatting, reviewing and submission of the manuscript for publication.

REFERENCES

1. Kaplan AM, Haenlein M. Users of the world, unite! The challenges and opportunities of Social Media. *Bus Horizons* 2010; 53:59-68.
2. Statista. Number of monthly active Facebook users worldwide as of 1st quarter 2019 (I million). Available at: <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>. Accessed March 26, 2019.
3. McCartney M. How much of a social media profile can doctors have? *BMJ* 2012; 344:e440.
4. Singapore Medical Council. Ethical Code and Ethical Guidelines, 2016 Edition. Available at: [http://www.healthprofessionals.gov.sg/docs/librariesprovider2/guidelines/2016-smc-ethical-code-and-ethical-guidelines---\(13sep16\).pdf](http://www.healthprofessionals.gov.sg/docs/librariesprovider2/guidelines/2016-smc-ethical-code-and-ethical-guidelines---(13sep16).pdf). Accessed April 2, 2019.
5. Brown J, Ryan C, Harris A. How doctors view and use social media: a national survey. *J Med Internet Res* 2014; 16:e267.
6. Duggan M, Brenner J. The demographics of social media users, 2012. Available at: http://boletines.prisadigital.com/PIP_SocialMediaUsers.pdf. Accessed March 26, 2019.
7. Chretien KC, Goldman EF, Beckman L, Kind T. It's your own risk: medical students' perspectives on online professionalism. *Acad Med* 2010; 85(10 Suppl):S68-71.

8. Chretien KC, Greysen SR, Chretien JP, Kind T. Online posting of unprofessional content by medical students. *JAMA* 2009; 302:1309-15.
9. Avcı K, Çelikden SG, Eren S, Aydenizöz D. Assessment of medical students' attitudes on social media use in medicine: a cross-sectional study. *BMC Med Educ* 2015; 15:18.
10. Guseh JS 2nd, Brendel RW, Brendel DH. Medical professionalism in the age of online social networking. *J Med Ethics* 2009; 35:584-6.
11. Sterling M, Leung P, Wright D, Bishop TF. The use of social media in graduate medical education: a systematic review. *Acad Med* 2017; 92:1043-56.
12. Whyte W, Hennessy C. Social media use within medical education: a systematic review to develop a pilot questionnaire on how social media can be best used at BSMS. *MedEdPublish* 2017; 11:6.