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ORIGINAL ARTICLE

Utilization patterns of social media platforms for learning purposes among emergency medicine residents in Saudi Arabia

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ABSTRACT

Background: Digital platforms' usage in medical education is pivotal worldwide. Despite the benefits and hazards of social media use in emergency medicine (EM) education, little is known about young medical residents' attitudes and social media habits when they begin their EM careers.

Objectives: The study aimed to estimate the utilization rates of different social media platforms for educational purposes by EM residents in Saudi Arabia.

Methods: A focused revisit of this relationship between hand size and ventilation performance through manikin simulation testing of 122 emergency medical services professionals in Maryland evaluated the ventilator parameters of breath rate (BR), tidal volume (TV), and MV.

Results: A total of 110 EM residents participated in the study. Data showed that the most used platforms for professional purposes were medical applications (29.1%), WhatsApp, and YouTube (20.0% and 16.4%), and the least used application was Instagram (0.9%). Medical applications were the most utilized platform for knowledge searching (61.8%). More than half of the participants (55.5%) believe that social media's impact on their knowledge and clinical skills is high/very high. There was no significant difference between males and females regarding the utilization pattern of social media platforms.

Conclusion: EM residents consider social media a vital source of knowledge and skills required for their practice. Residents are aware of the benefits and harms of the professional use of social media platforms for medical education.

Keywords: Education, emergency medicine, Saudi Arabia, social media.

Introduction

The terminology "social media" refers to digital platforms that allow people to share thoughts and knowledge with others [1]. The growth of the free open access medical education motion was prompted by the social media rise as a tool for transferring knowledge [2]. Organizations concerned with educational paradigm guidance for medical specialties, such as the Council of Emergency Medicine Residency Directors (CORD), have developed recommendations to utilize these social media platforms [3]. Social media is also being used by residency programs for recruitment, collaboration, and education [4]. Several programs indicate enhanced learner satisfaction, peer collaboration, and the advantages of online learning [5].

According to the Babson Survey Research Group study, more than 60% of all participants had utilized social networks throughout the course [6]. Cheston et al. [7] found that the use of digital platforms in medical education is pivotal.

Uses' diversity inside training programs has increased along with these technologies for medical education. Emergency medicine (EM) residency programs use Twitter® to share teaching material from regular

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conferences [8]. Journal clubs can be accessed remotely using video-based applications that integrate Twitter® and blogs [9]. Social networks can be used to tutor people's electrocardiogram interpretations [10]. A wiki-based platform can be used to exchange and update a whole encyclopedia of basic emergency medical information [11]. Hence, the potential for combining social media with medical education is limitless.

Despite advantages, social media carry legal, ethical, social, and personal concerns [12]. Privacy disclosure reports and formal issues are leading up to the end of the technology [13]. Many institutions have implemented restrictions regarding posting content that could have professional implications due to these concerns [14]. Hence, not all residency programs have been equally effective in incorporating social media platforms into their curriculum [15].

Despite the benefits and hazards of using social media in EM education, little is known about this topic [16]. There is a lack of information about young medical residents' attitudes and social media habits when they begin their EM careers. The effect of social media policy on these residents' attitudes is unclear [17]. Understanding how these doctors utilize social media could improve education delivery and optimize its usage in graduate clinical training [16]. Hence, based on their responses to the study questionnaire, we conducted this cross-sectional study to highlight the patterns of EM residents in Saudi Arabia using different social media platforms for educational purposes.

Methods

Study design and participants

The study was cross-sectional to estimate the utilization rates of social media platforms for educational purposes by EM residents in Saudi Arabia, held from September to December 2019. It was conducted in all accredited residency programs in EM in Saudi Arabia. The Saudi Board of EM is implemented at hospitals in Riyadh, Jeddah, Dammam, Abha, and recently in Makkah and Taif. Emergency residents who joined the Saudi EM board were invited to participate as well. Ethical approval and a license were obtained before conducting the study.

Sampling

The number of EM residents who joined the Saudi program for EM is 410. Due to the low expectation of online participation, we invited all the residents to participate in the study to obtain sufficient participants.

Data collection

Data were collected using a validated questionnaire via the online tool Survey-Monkey™. It was an English-based, modified, and semi-structured questionnaire [8]. It contained open and closed-ended questions.

The survey link was distributed through the official WhatsApp™ groups of EM residents. An introduction was clarified, including the research idea and goal. Participants did not receive any financial or educational incentives. Feedback was collected in an excel sheet. Responses were reached on the Survey-Monkey™. The excel sheet was introduced to the Statistical Package of Social Sciences Software Program (SPSS) for statistical analysis.

Statistical analysis

After data collection, data were entered into IBM© SPSS© Statistics version 20 (IBM© Corp., Armonk, NY) and were analyzed using descriptive statistics of frequency and percentage, mean ± SD. The *t*-test was used to compare quantitative variables, and the chi-square test was used to compare qualitative variables. The significance of the results was determined by calculating the *p*-value as a *p*-value ≤ 0.05 indicates a significant influence.

Results

A total of 110 EM residents were included in the study. About 70% of the participants were males (n = 77) and 30% were females (n = 33). Most participants (78.2%, n = 86) were 25-30 years old. Most students were in their

Table 1. *Demographic characteristics of the study population.*

Study variables		Number (total 110)	%
Age (years)	25-30	86	78.2
	30-35	18	16.4
	>35	6	5.5
Gender	Male	77	70.0
	Female	33	30.0
Year of training	PGY* 1	38	34.5
	PGY 2	32	29.1
	PGY 3	23	20.9
	PGY 4	17	15.5
Training center	Abha	3	2.7
	Dammam and Khobar	37	33.6
	Jeddah	46	41.8
	Makkah	6	5.5
	Riyadh	18	16.4

*PGY: Post graduate year.

first year of training (34.5%, *n* = 38) and were receiving training in Jeddah (41.8%, *n* = 46). Table 1 shows the demographic characteristics of the participants.

Regarding social media utilization, the most used social media platform for professional purposes are medical applications (29.1%, *n* = 32), followed by WhatsApp and YouTube (20.0%, *n* = 22 and 16.4%, *n* = 18 respectively). The least used application is Instagram (0.9%, *n* = 1), and 0.9% of the participants reported not using social media for professional purposes. Similarly, medical applications remain the most utilized social media platforms for knowledge searching (61.8%, *n* = 68), followed by YouTube (17.3%, *n* = 19). The most utilized social media platform when obtaining skills is YouTube (87.3%, *n* = 96), followed by medical applications (7.3%, *n* = 8). Most participants reported using WhatsApp (65.5%, *n* = 72) for personal purposes (socializing with friends and family). Table 2 shows the utilization of social media by the study participants.

Almost half of the residents (49.1%, *n* = 54) reported using social media for learning purposes for 2-5 hours per week, while only two participants (1.8%, *n* = 2) use them for less than 1 hour a week, as shown in Figure 1.

How long do you use social media for learning purposes?

Only 26.4% of the participants (*n* = 29) reported not following a service that updates them on events and news in the field of EM. The most followed websites are the Saudi Society of Emergency Medicine (SASEM) (9.1%, *n* = 10), American College of Emergency Physicians (ACEP) (8.2%, *n* = 9), Emergency Medicine Reviews and Perspectives (EM: RAP) (4.5%, *n* = 5), and Medscape (4.5%, *n* = 5).

The most followed EM associations on social media are ACEP (24.5%, *n* = 27), SASEM (14.5%, *n* = 16), Rational Evidence-Based Evaluation of Literature in Emergency Medicine (REBEL EM) (7.3%, *n* = 8), and Emergency Medicine Residents' Association (EMRA) (6.4%, *n* = 7). When asked about ethical rules when dealing with patient confidentiality on social media, 93.6% of the participants reported that they follow the ethical rules.

Regarding the perception of social media, 89.1% (*n* = 98) of the participants believe that social media helps them learn. They mentioned that social media are helpful as they provide them with a quick way to access information, engage in discussions with field experts, share knowledge, and interact with their peers. They find social media platforms practical, flexible, organized, updated, and concise. For example, one can listen to educational podcasts while driving. Nine participants (8.2%) consider that social media are not helpful for learning because they find it sophisticated and can break the confidentiality of their patients.

About the influence of social media on the knowledge and clinical skills of the participants, 7.3% (*n* = 8)

Table 2. *Social media utilization patterns by the study participants.*

Study variables		Number (total 110)	%
Social media platforms used professionally (working, research, learning, or academic purposes)	Medical applications	32	29.1
	WhatsApp	22	20.0
	Twitter	20	18.2
	YouTube	18	16.4
	Podcasts	7	6.4
	Google	4	3.6
	LinkedIn	3	2.7
	Facebook	2	1.8
	Instagram	1	0.9
Social media platforms used when searching for knowledge	Medical applications	68	61.8
	YouTube	19	17.3
	Twitter	12	10.9
	Podcasts	6	5.5
	Google	3	2.7
	WhatsApp	2	1.8
Social media platforms used to obtain skills	YouTube	96	87.3
	Medical applications	8	7.3
	Twitter	4	3.6
	Podcasts	2	1.8
Social medial platforms used in a personal way (social, communicating with friends or family)	WhatsApp	72	65.5
	Snapchat	15	13.6
	Twitter	15	13.6
	Instagram	5	4.5
	Facebook	2	1.8
	YouTube	1	0.9

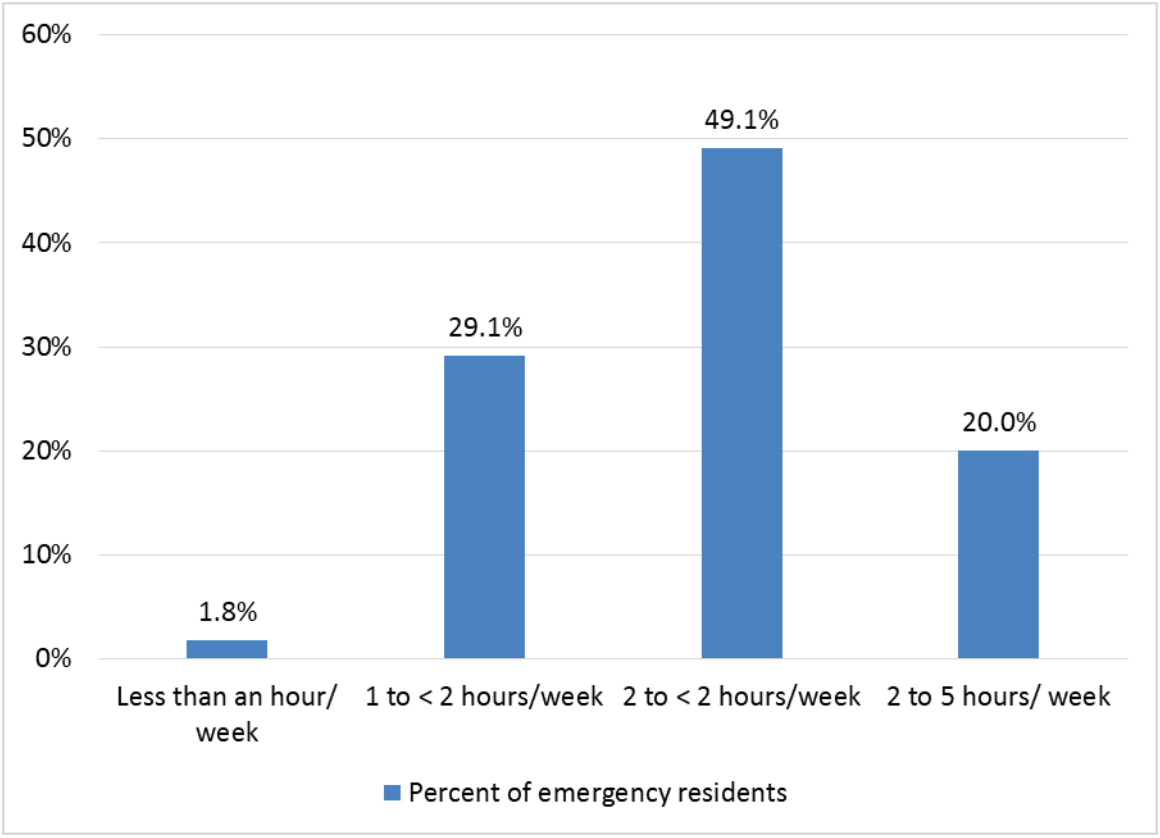

Figure 1. *The average time spent on utilizing social media platforms for learning purposes.*

of the participants said that social media had a huge influence on their knowledge and clinical skills, 48.2% (n = 53) of the participants mentioned that social media had a big influence on their knowledge and clinical skills, 39.1% (n = 43) of the participants said that social media had a moderate influence on their knowledge and clinical skills, 4.5% (n = 5) of the participants see that social media had a low influence on their knowledge and clinical skills, and 0.9% (n = 1) of the participants believe that social media did not influence their knowledge and clinical skills. Around 60.9% (n = 67) of the participants do not think that social media has a negative impact on their EM practice. However, 35.5% (n = 39) of the participants think that social media negatively impacts their EM practice and 3.6% (n = 4) of the participants think that social media negatively impact their EM practice. This is because social media resources are sometimes not updated, and random information can be retrieved from the internet. Additionally, social media can be misleading, time-consuming, and cannot teach practical skills. The perceptions of the participants on social media are detailed in Table 3.

Figure 2 shows participants' recommendations of social media platforms for learning purposes. The most recommended social media platforms for learning purposes are WikiEM (28.2%, n = 31), EM RAP (10%, n = 11), EMRA (10%, n = 11), REBEL EM (10%, n = 11), UpToDate (10%, n = 11), Medscape (7.3%, n = 8), Rosh (7.3%, n = 8), Crack Cast (6.4%, n = 7), Life in the Fast Lane (6.4%, n = 7), and Twitter (6.4%, n = 7).

There was no statistically significant relationship between demographic characteristics and the duration of using social media for learning purposes ($p > 0.05$). Statistical analysis revealed no significant difference between the genders in terms of social and medical platforms utilization rates ($p > 0.05$).

Social media influence on participants' knowledge and clinical skills among the different subgroups is shown in Table 4.

Discussion

This is a cross-sectional study to estimate the utilization rates of different social media platforms for educational purposes by EM residents in Saudi Arabia. A validated questionnaire was used to collect data from 110 EM residents who joined the Saudi program for EM.

Only 0.9% of the participants reported not using social media platforms for professional purposes. This percentage is close to the results reported by Avcı et al. [18] who found that 93.4% of medical students used social media, and 89.3% used social media for professional purposes.

Medical applications were the most used social media for professional purposes (29.1%, n = 32), followed by WhatsApp and YouTube (20.0%, n = 22 and 16.4%, n = 18, respectively). Most participants (around 65%) reported using WhatsApp for personal purposes (communicating with their friends and family). Almost half of the participants (49.1%, n = 54) reported using social media for learning purposes for 2-5 hours per

Table 3. *Participants' perceptions of social media.*

Study variables		Number (total 110)	%
Do you think the utilization of social media for learning is helpful?	Yes	98	89.1
	Sometimes	2	1.8
	No	9	8.2
If yes, why?	Easy	24	24.5
	Fast	11	11.22
	Discuss with the experts	7	7.14
	Entertaining	7	7.14
	Sharing knowledge	7	7.14
	To the point	5	5.10
	Updated	5	5.10
	Practical	4	4.08
	Flexible	4	4.08
	Interaction	1	1.0
	Organized	1	1.0
	Can listen to podcasts while driving	1	1.0
	Simplified	1	1.0
If not, why?	Sophisticated	1	11.1
	It can break the patient's confidentiality	1	11.1
	Unorganized	1	11.1
Please rate the influence of social media on your knowledge and clinical skills.	None	1	0.9
	Low	5	4.5
	Moderate	43	39.1
	High	53	48.2
	Very high	8	7.3
Do you think the utilization of social media in EM has a negative impact?	Yes	39	35.5
	Maybe	4	3.6
	No	67	60.9
If yes, why? (n = 39)	Sometimes, the information is not evidence-based	15	38.5
	Breach of confidentiality	9	23.1
	Time-consuming	2	5.1
	Sometimes, it is not updated	2	5.1
	Equivocal	1	2.6
	Not suitable for hand skills	1	2.6
	Random information	1	2.6
	Results in isolation instead of engaging with experts around you	1	2.6
	Sometimes, it is confusing	1	2.6
	Sometimes, it is impractical	1	2.6
	Can be misleading	1	2.6

week, while only two participants (1.8%, n = 2) use them for less than an hour a week. Galiatsatos et al. [19] reported that the most used social media platforms were Facebook, YouTube, and podcasts. Another study by Almutairi et al. [20] showed that 93% of the residents reported using social media for education. They reported that approximately 36.6% of the participants used social media daily for education. The most used platforms were YouTube (73%), Google+ (32.3%), and Twitter (14.3%).

We found that 61.8% of participants used social media platforms to search for knowledge and 17.3% utilized YouTube. The most utilized social media platform is YouTube (87.3%) to gain skills, followed by medical applications (7.3%). Alhaddad [21] reported that around 6% and 18% of respondents use social media to search for medicines-related information daily and weekly. He found that around 41.2% of the respondents prefer to receive medical-related information daily from official online resources. Another study by Latif et al. [22] found that medical students use mobile applications for medical calculations (75%), read online textbooks (70%), listen to medical podcasts (60%), attend online lectures (50%), and take notes (45%). They reported that medical students use their smartphones for communication, education, and entertainment. They reported that Facebook, WhatsApp, and Edmodo were the most commonly used applications.

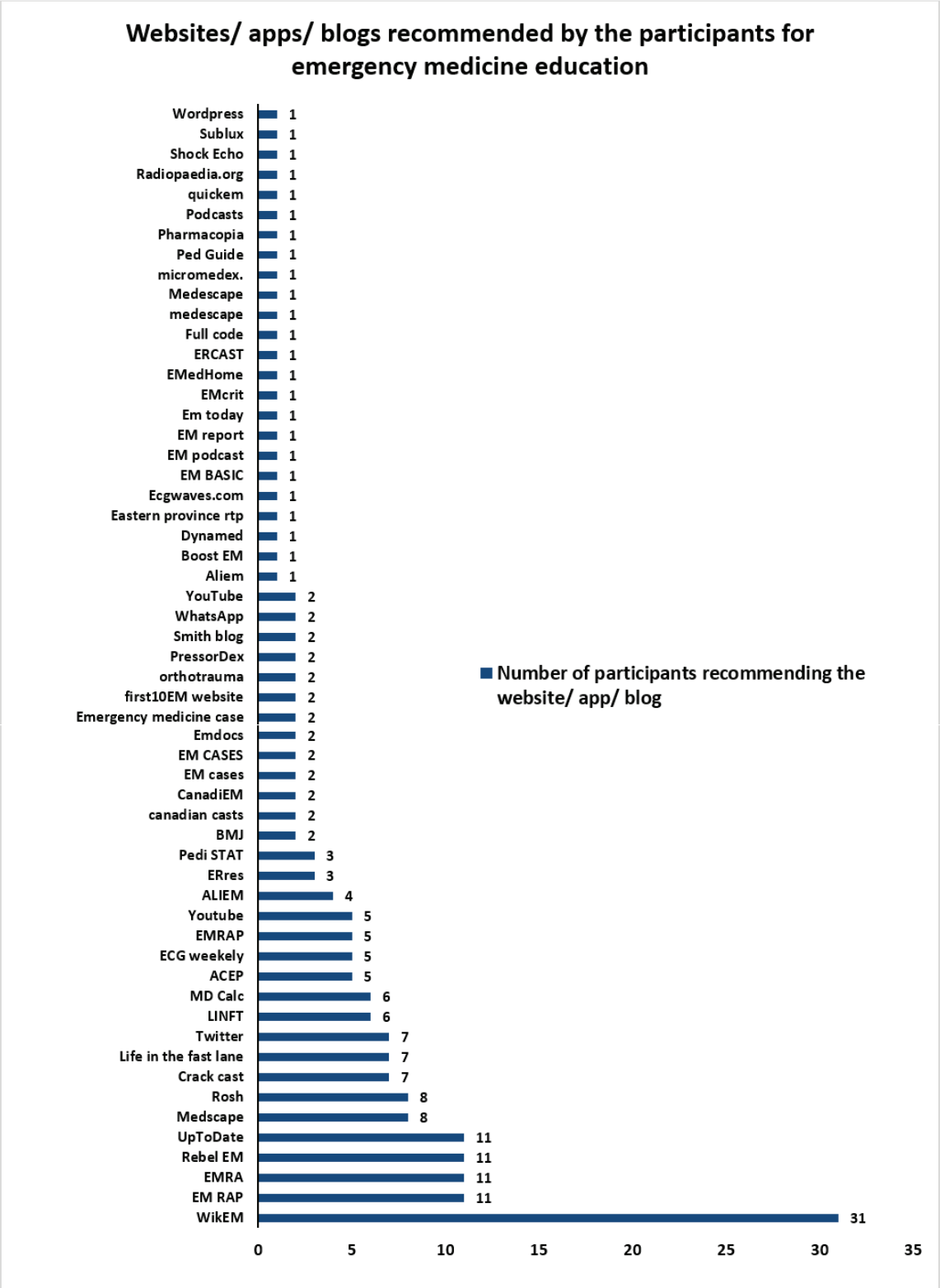

Figure 1. *The average time spent on utilizing social media platforms for learning purposes.*

Our results revealed that around 89.1% of the participants believe using social media helps them learn. The participants consider that social media platforms are helpful as they provide them with an easy way to access information, engage in discussions with experts in the field, share knowledge, and interact with their peers. Additionally, they believe that social media platforms are practical, flexible, updated, and concise. The participants believed that these platforms have benefits, allowing them to collaborate, engage with peers, and obtain feedback. Yet around 8.2% of the respondents find social media platforms to be sophisticated and can break the confidentiality of their patients and not be beneficial. Similarly, Latif et al. [22] reported that social media's

Table 4. *The influence of social media on participants' knowledge and clinical skills among the different subgroups (n = 110).*

Factors		Please rate the influence of social media on your knowledge and clinical skills										*p*-value*
		None		Low		Moderate		High		Very high		
		Count	%	Count	%	Count	%	Count	%	Count	%	
Age (years)	25-30	1	1.2	3	3.5	34	39.5	40	46.5	8	9.3	0.636
	30-35	0	0.0	1	5.6	8	44.4	9	50.0	0	0.0	
	>35	0	0.0	1	16.7	1	16.7	4	66.7	0	0	
Gender	Male	1	1.3	3	3.9	28	36.4	41	53.2	4	5.2	0.400
	Female	0	0.0	2	6.1	15	45.5	12	36.4	4	12.1	
Year of training	R1	0	0.0	1	2.3	16	42.1	20	52.6	1	2.6	0.340
	R2	0	0.0	1	3.1	11	34.4	16	50.0	4	12.5	
	R3	1	4.3	2	8.7	12	52.2	6	26.1	2	8.7	
	R4	0	0.0	1	5.9	4	23.5	11	64.7	1	5.9	
Training center	Abha	0	0.0	0	0.0	1	33.0	1	33.0	1	33.0	0.630
	Dammam and Khobar	0	0.0	1	2.7	15	40.5	20	54.1	1	2.7	
	Jeddah	0	0.0	3	6.5	16	34.8	22	47.8	5	10.9	
	Makkah	0	0.0	0	0.0	4	66.7	2	33.3	0	0.0	
	Riyadh	1	5.6	1	5.6	7	38.9	8	44.0	1	5.6	

*chi-square test.
*$p < 0.05$, deemed significant.

negative aspects include addiction, distraction, increased difficulty of face-to-face communication, affecting academic performance, and privacy violations.

Regarding the ethical rules when dealing with patient confidentiality on social media, 93.6% of the participants reported that they consider this point. Instead, Lefebvre et al. [17] found that young physicians demonstrated a casual approach to social media and need further education on maintaining online professionalism and confidentiality of patients' data.

Regarding social media's impact on the knowledge and clinical skills of the participants, 7.3% of the participants said that social media had a very big influence, 48.2% mentioned that social media had a big influence, 39.1% believe that social media had a moderate influence, 4.5% of the participants believe that social media had a low influence, on their knowledge and clinical skills, while 0.9% of the participants believe that social media had no influence on their knowledge and clinical skills. According to the CORD Social Media Committee, the social media use pattern by EM residents is increasing. Social networks are being used for educational purposes with a high percentage of learner satisfaction. The study reported that learners believe social media allows them to collaborate with their peers and provide complementary learning [3].

Around 60.9% of the participants do not think that social media has a negative impact on their EM practice. However, 35.5% of the participants mentioned that social media has a negative impact on their EM practice and 3.6% of the participants said that social media may have a negative impact on their EM practice. The reasons were such as outdated resources of social media content and sharing random information that is retrieved from the internet. Additionally, social media can be misleading, time-consuming, and impractical. The impact of social media on learning scores among family medicine residents was around 36.2%-100% [21]. A systematic review by Cheston et al. [7] showed that technical issues were reported in six (43%) of the included studies. Also, some steps were reported to be time-consuming when utilizing social media platforms.

Only 26.4% of the participants (n = 29) reported not following a service that updates them on events and news in the field of EM. The most followed EM associations on social media are ACEP (24.5%), SASEM (14.5%), REBEL EM (7.3%), and EMRA (6.4%). As per the participants, the most recommended social media platforms for learning purposes are WikiEM (28.2%), EM RAP (10%), EMRA (10%), REBEL EM (10%), UpToDate (10%), Medscape (7.3%), Rosh (7.3%), Crack Cast (6.4%), Life in the Fast Lane (6.4%), and Twitter (6.4%).

There was no statistically significant relationship between demographic characteristics and the duration of using social media for learning purposes ($p > 0.05$). Additionally, statistical analysis showed no correlation between gender and utilizing social media platforms to find out about recent updates in EM or the ranking of social media importance according to their influence.

Conclusion and Recommendations

Based on the results, it can be concluded that EM residents depend significantly on the different social media platforms as a vital source of knowledge and skills that are required for their clinical practice, with no significant difference between males and females in this regard. Accordingly, it is important to ensure adequate censorship of the theoretical as well as practical EM-related content that is shared and discussed on social media platforms especially medical applications, WhatsApp groups, and YouTube as a large proportion of emergency residents depend on them for professional purposes to obtain knowledge and skills. The study results showed that residents are aware

of the potential harms of the professional use of social media platforms for medical education, such as sharing information that is not evidence-based and breaching patients' confidentiality. To overcome these harms, it is vital to raise the awareness level of emergency residents about the importance of verifying the source and accuracy of each piece of information before applying it in their clinical practice.

List of Abbreviations

ACEP	American college of emergency physicians.
CORD	Council of emergency medicine residency directors.
EM	Emergency medicine.
EMRA	Emergency medicine residents' association.
EM: RAP	Emergency medicine reviews and perspectives.
PGY	Post graduate year.
REBEL EM	Rational evidence-based evaluation of literature in emergency medicine.
SASEM	Saudi society of emergency medicine.

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to participate

Written consent was obtained from all the participants.

Ethical approval

Ethical approval was granted by the Institutional Review Board, King Abdullah International Research Medical Centre (KAIMRC), Letter no.: IRBC/0798/19, Date of approval: 29 MAY 2019.

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