## REVIEW

# Use of Smart Phones and Social Media in Medical Education: Trends, Advantages, Challenges and Barriers

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**ABSTRACT**

**Introduction:** The technological advancements have transformed the society into a global forum influencing the educational processes and learning environments. Medical education is no exemption with an increasing trend to use the social media and smart phones for teaching and learning. Facebook, WhatsApp, Instagram, YouTube and Edmodo are the platforms promoting collaborative learning, improved communication and knowledge sharing. **Aim:** This study aims to review the use of smart phones and social media in the context of medical education. It reviews the usage of smart phone and social medical applications including Facebook, WhatsApp and Edmodo for teaching and learning in medical education. **Results:** The use of personal smartphones for teaching and learning among medical community is highly prevalent and increasing day by day. Medical students use the mobile application for online textbooks (70%), medical podcasts (60%), medical calculator (75%), online lecture (50%) and notes taking (45%). Relevant studies conclude that the majority of students use smart phones for education (62.7%), communication (81.7%) and recreation (82.5%). Social media has a great potential in educational setting and provide students a chance to involve, share and express knowledge and information with each other. Facebook, WhatsApp and Edmodo are the commonly used applications having multiple benefits like collaboration, feedback and engagement but negative aspects including addiction, distraction and maintenance of privacy have also been found. **Conclusion:** The review article concludes that social media is a powerful instrument for social interactions and is also used as a tool for teaching and learning. The integration of social media with traditional class teaching in medical education has clear advantages but there is a debate about the probable disadvantages as well.

Keywords: Smart phones, social media, Facebook, WhatsApp, Edmodo, medical education.

## 1. INTRODUCTION

Today, the social networking through online resources is not a new concept. The creation of the World Wide Web emerged as an extensive online activity developing many groups and communities. These online communities are considered as the ancestor of social networking sites developed over the past decade. Social media is "a group of Internet-based applications or 'interactive platforms' which allows the creation and exchanges of the content generated by the users". There is a rapid growth in these networking sites and complexities are decreasing day by day resulting in more friendly applications for the young and older individuals (1). Social media is one of the most influential tools originating versatile information. It includes the online technology permitting people to communicate easily through the internet and to share the resources. Different philosophies of learning regarding social networks have been emphasized in literature including the motivation through social connections, teaching by collaboration, and improvement in learning by immediate and frequent feedback and engagement. The "social constructivism theory" based on the description that interaction and socialization can help students to learn and construct their knowledge and personal learning processes, explains the use of social media for educational activities. Social media facilitates the participative learning and acts as a set of constructivist tools for

teaching and learning (2).

Teaching in the 21st century is considered as a very exciting activity because of the resources, collaboration, and opportunities. Social media is an economical and best possible tool for the global collaborations (2). It has been estimated that nearly 80% of the young individuals have an account on a social networking sites (2). It is considered as a fundamental part of the life of many young persons. It has revealed the talents of young generation and provides the relevant opportunities on a single click. The Students can share problems, issues and get back several recommendations from the online peers and teachers.

Now a day, majority of teachers and students use smart phones and have access to the internet. Similarly, the use of social media is a regular practice among college students. This availability of smart phones and internet facility leads to connectivity with peers and friends. The common use of social media network sites like Facebook and WhatsApp is for the purpose of communication and entertainment. However, there is an increased practice of these applications for learning including medical education as well. These services are also considered as a distractor for learning and wastage of time resulting in a decline of overall academic performance of the students.

## 2. AIM

This article aims to study the use of smart phones and social media in the context of medical education. It reviews the importance of smart phone and their usage for medical education. Facebook, WhatsApp and Edmodo have been studied as learning tools along with the latest trends, advantages and barriers regarding the use of social media applications for educational purposes.

## 3. METHODS

The relevant articles were searched from online data sources including PubMed, ERIC and Google scholar. Different key words, subject terms or descriptors were used to locate the relevant sources including; social media, Learning, Facebook, WhatsApp, Edmodo, students and medical education. The search was also performed by using the advanced options and application of filters so that most relevant articles can be retrieved. Boolean operators (and, or, not) were also used to broaden or narrow down the search. The results of different search terms used independently and with Boolean operators are presented in the Table 1. The individual search terms yielded a large number of results. However, the results with Boolean operators retrieved a reasonable number of articles in ERIC and PubMed.

## 4. RESULTS

The retrieved articles were reviewed by the authors and the results are presented along with the relevant discussion under different headings

### 4.1. Smart Phones and learning of medical students

Smart phones are handheld devices having touch screen with large displays and capacious memory which are used for telecommunication and other functions. The last de-

| Sr. | Search Terms | Results of Search | | |
|-----|--------------|-------------------|------|--------|
| | | Google Scholar | ERIC | PubMed |
| 1 | Social media | 3,870,000 | 12,597 | 16357 |
| 2 | Learning | 5,450,000 | 426,257 | 490237 |
| 3 | Facebook | 5,630,000 | 1,161 | 2049 |
| 4 | WhatsApp | 51,200 | 28 | 113 |
| 5 | Edmodo | 9,760 | - | 71 |
| 6 | 1 and 2 | 3,760,000 | 4,276 | 1061 |
| 7 | 1 and 2 and 3 | 991,000 | 318 | 98 |
| 8 | 1 and 2 and 4 | 14,400 | 12 | 1061 |
| 9 | 1 and 2 and 5 | 4,360 | 7 | 5 |
| 10 | 1 and 2 and 3 and 4 and 5 | 4360 | 0 | 2 |

Table 1. Description of the results from various databases based on different search terms

cade has witnessed a tremendous increase in the utilization of smart phones in different aspects of personal and professional life. The findings of different relevant studies about the student's ownership of smart phone conclude that 85% of the university students in Canada personally own a smart phone, where as in the United Kingdom and Unites States of America 80% of the medical students personally own such gadgets. This number is 100% among the university students of South Korea and Saudi Arabia (3, 4). The availability of these devices in 80 percent to 100 percent of the learners is an excellent opportunity to utilize them for the learning purposes. A multicenter study among residents of Saudi Arabia reveals that use of mobile phone among medical residents has become a universal phenomenon in academic and clinical settings. This study also described that the health care institutes and medical leadership should support proper utilization of these devices for medical education and clinical decision making but more importantly, the confidentiality of the patients must also be ensured (5).

Relevant studies conclude that the majority of students use smart phones for education (62.7%), communication (81.7%) and recreation (82.5%) (6). Medical students use the mobile application for online textbooks (70%), medical podcasts (60%), medical calculator (75%), online lecture (50%) and notes taking (45%) (3). A study found that smart phones have wonderful influence on the education especially with easy access relevant resources through internet (7). The use of smart phone as a learning aid among medical students in India revealed that 96% of the study subjects were having smart phones and 90% reported to have required skills for the use related to medical education (8). Similarly, 79.4% of the study participants desired to include the smart phones application in the curriculum of MBBS (8). The use of smart phones in the context of profes-

sionalism among the medical students concluded that smartphone is a powerful tool that can be used to improve the health care system. However, these devices are not problem free and found to be linked with certain issues. There is an urgent need to develop and implement regulations for a pro-technology medical education, health centered, and safe world (9). The term M-learning is commonly used in literature and is defined as "learning across multiple contexts, through social interactions, using personal electronic devices" (10).

M-learning provides a motivating environment leading to better quality of teaching and learning and promotes critical thinking abilities of the students. It is also helpful in better engagement, motivation, collaboration, and goal achievements through conducive learning environments (11,12). The use of personal smartphones for clinical work among medical students is highly prevalent and increasing day by day. There are multiple benefits including proper engagement, collaboration and conducive learning activities but it is highly desired to address the issues related with the confidentiality of patients (13). During the last decade, there is a gradual increase in the successful use of smart phones and social media in higher education (6). It is the high time that medical institutions should consider these gadgets as an adjunctive tool to the conventional teaching and ensure their usage to enhance the learning experiences.

### 4.2. Social media and medical education

Social media has become an important tool for collaboration, information and knowledge sharing among peers as well as among learners and facilitators. Research studies have proved a better communication among teachers and students through these applications. Social networking sites are helpful to improve personal skills and professional communication by continuous posting of pictures, videos, audios, chatting, writing blogs, creating and editing individual profiles (14). The results of a study revealed that a large number of female students were using social media. However, these findings are contrary to the results of other studies describing that male students were more comfortable with the use of these tools (15). Majority of the college students were more competent with the usage of social media especially Facebook and YouTube as the most commonly used tools (15). Apart from the gender-based utilization, it is evident that social media is being used for educational activities and is a potential tool for the enhancement of quality through engagement of different stakeholders.

In recent years researchers and educators have recognized the importance of social media for their professional determinations in a variety of ways for teaching and learning. Faculty members are considered among the key stakeholder of any educational system. They should be familiar and competent with the use of the latest educational developments, appropriate technologies and tools to enhance learning experiences efficiently. Importantly, the higher education institutes has effectively supplemented the traditional class room teaching with emerging social media tools (16). Social media is getting increase in its use both within and outside the classroom (17). Some studies have evaluated the role of social media in the performance of students as well. A systematic review concluded that connections, communications and interactions

are facilitated by these platforms. Health professionals use these tools for networking, clinical practice and educational purpose. However, these advancements are also associated with limitations including professionalism, and risks of data protection (18). Research has introduced the theoretical aspects of social media use and its potential impact on healthcare. The studies reflect that there are multiple opportunities and responsibilities for medical educators. It may support the professional development, promote collaborative research and enhance scholarly communication. However, there is an increased requirement about the use of these technologies in academic settings otherwise they may work as distractors. Researches describe that the use of social media in medical education is on the rise and it is expected that this influence will remain continued in the days to come. However, the textbooks, peer reviewed publications, teachers, mentors and critical appraisal of all the sources should be considered mandatory for the learning and understanding of basic concepts (19). A relevant review of literature concluded that social media plays an important role in the provision of medical information but the evidence about its significance to enhance learning process is still debatable (20). The current perspective of social media as an open-learning resource in medical education concluded that these technologies have unlocked versatile opportunities. This is an innovative shift and needs evidence through laborious research to understand functionality and outcomes (21). Social media has been adopted rapidly in medical education but the concerns are consistently evolving about its potential risks (22). A systematic review consisting of twenty-nine studies revealed that twitter, podcasts, and blogs were frequently used to engage learners and augment education (23).

### 4.3. Facebook as a learning tool

Facebook has been considered as a teaching tool to facilitate communication between teachers and students and it also improves students' academic performance (24). Other benefits of Facebook as a learning tool include; active learning, collaboration, interaction, information and knowledge exchange (25). The use of social media for small group learning has been studied and most of the study participants used Facebook to facilitate communication and for the circulation of documents. The platform supports collaborative learning, help for the development of critical appraisal skills and provide awareness regarding health issues (26). Facebook is also mentioned as a medium of communication for social and educational purposes among the medical students of UK. It is used to support their education in the form of six themes including collaborative learning, assessment, experiences sharing and provision of support, making and sustaining connections, planning and organization and evaluating educational resources. This study settles that Facebook is being used by the medical students for the improvement of learning (27). The early days of the year 2017, witnessed that there are around two billion monthly active users of social networking sites and Facebook engages maximum number of these users. It has been emerged as a leading community of medical students for the purpose of learning and considered as an essential part of learning environment (28). The faculty members should benefit from different Facebook groups and use them for

the improvement of learning experiences.

### 4.4. WhatsApp as a learning tool

WhatsApp is a free application which may be used to send messages, pictures, video and audio files. It can also be used for communication between students and teachers for motivation and sharing of learning materials. Achievements of learning through WhatsApp has been studied and found that students rate it as the most popular social medium beside Facebook and twitter. A relevant study concluded that WhatsApp based M-learning emerged as an excellent adjuvant to class-room teaching in terms of ubiquitous availability and collaborative learning (29). A study highlighted the importance of social media including WhatsApp as an important tool to enhance teaching & learning in medical education. It is also considered as an effective space for integrated learning and sharing of curriculum to improve the teaching and learning process (30). Research studies have concluded that there is gender-based variation about the use of WhatsApp as a learning tool and female students were more comfortable and perceived it as an appropriate tool for communication with teachers. Contrarily, WhatsApp is also linked with some drawbacks like superficial learning and distraction from the text books (31, 32).

### 4.5. Edmodo as a learning tool

Edmodo is another social media tool and also known as the Facebook of education. It is a safe, and free of cost learning platform. Edmodo authorize teachers to manage the platform with a password protected account of students and used to connect teacher and students outside the class. Students can join the forum after an invitation by the teacher. Moreover, the teacher can share materials, video, quiz assignments and polls at Edmodo where the students can easily comment, download or submit assignments anytime, anywhere without coming to the class. Edmodo network enables teachers to manage communication with students, colleagues, and parents. This platform is teacher-centric in their design and philosophy. Teachers and students spend large amounts of time on the platform, both in and out of the classroom. It is considered as an effective tool for teachers to enhance the learning process beyond the classroom. The relevant research describes, Edmodo as a tool for collaboration of class and consider it among the best social networking sites for education (33).

### 4.6. Benefits of Social media in education

Social media has a great potential in educational setting and provide students a chance to involve, share and express knowledge and information with each other. The interaction and socialization with others based on social constructivism theory is helpful for learning and knowledge creation. Social media can be used as constructivist tools to supplement the traditional learning. The traditional teaching can be made interactive with the use of sharing the materials in the form of videos, pictures and discussion forum. Facebook provides comfortable, user friendly and easily accessible tool engaging the students outside the class promoting learning, collaboration and exchange of ideas. On the other hand, the educational value of Facebook may be questioned. But still it is evidence based that Facebook is a powerful tool for learning in medical education. Edmodo, as proved by many researchers, can be an alternative online learning platform to be used in the classroom as well. Many researches showed that Edmodo can be one of effective solutions for blended learning. The WhatsApp mode of M-learning has definitely improved the overall interactions between students as well as student-teacher. It helped with better and quicker knowledge sharing as well as group-discussion to come to a conclusion for better understanding. The mobile way of sharing knowledge and asking queries also helped the shy or over conscious students immensely and even helped in the improvement of their overall communicative skill. WhatsApp learning has facilitated learning at ease, anytime and anywhere. The participants admire the at hand availability of WhatsApp learning and sharing at their own convenience. They can ask and reply at their own time of study. Answers and rationale provided by group discussion or faculty are immensely helpful in adding the knowledge without spending much time in looking for various reference books and other sources.

### 4.7. Challenges and barrier in the use of social media for medical education

Faculty members have many concerns about the use of social media in and outside the class. A relevant research found that addition of social media has decreased participation in outdoor activities of the students leading to physical health issues (34). Individuals have to continuously update their profiles and sharing of personal information and increase of cyber-bullying which is of course very stressful and has bad effects on personal mental health of youth. Other think students devoting most of their time on social media have adverse effects on learning and they show poor grades in the examinations. Regarding Edmodo application, layout is too plain and boring with associated lag time in response. Additionally, text messaging is not an available feature. Therefore, students cannot use Edmodo for messaging to communicate with each other. Major negative aspects and barrier in the use of social media include the following:

- Addiction of social media acts as a distractor and divert attention of the students.
- Cyber-bullying can have severe adverse effects on the behavior of learners.
- Multiple concerns related to workload and time constraints.
- Maintenance of privacy and integrity.
- Lack of interest in peer feedback.
- Lack of appropriate training.
- Multitasking and managing social media during academic activities lead to contrasting effects on academic performance.
- Students who use social media excessively feel difficulty in face to face communication.

## 5. CONCLUSION

The review article concludes that social media is a powerful instrument for social interactions and is also used as a tool for teaching and learning. The integration of social media with traditional class teaching in medical edu-

cation has clear advantages but there is a debate about the probable disadvantages as well. The extent to which these tools are supportive for academic activities and learning experiences demand a robust evidence. The current technology driven era consider the use of social media and relevant gadgets, tools and applications as a mandatory requirement for medical education. There is a need to develop approaches for the handling of potential risks. The popularity of social media applications has already addicted the students. It is better to use these tools for educational purposes to intercept wastage of time.

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