

Review Article

The Ubiquitous Invasion of Social Media in Lifelong Learning in Medical Education: Review Article

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ABSTRACT

The field of health care is fairly diverse and rapidly changing. Knowledge and skills attained at the end of formal undergraduate and postgraduate medical education are not sufficient to maintain competence and performance throughout health professionals' entire career. Practitioners are required to be involved in lifelong learning, either through participating in organized continuing education programs, e.g. CME (Continuous Medical Education), CPD (Continuous Professional Development) or through individual learning activities. Social media encourages passive learners to become active learners through an attitude of sharing and interacting, far more than an attitude of retrieving. It is

hypothesized that in spite of the growing use of social media by health professionals, medical education hitherto has not assimilated these tools at all levels in form of CME/CPD credit. Many participants seemingly are maintaining their presence in multiple social media platforms to engage in social and learning activities. Social media has clear potential to contribute to lifelong learning in medical education.

This article examines the recent literature in the use of social media as a learning tool for lifelong learning, followed by a discussion on the emerging role of social media in medical education. The article also explores various factors affecting social media use in medical education.

KEY WORDS: education, internet, medicine, students, teaching

INTRODUCTION

Social media have been defined 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"^[1]. In congruence to every other facet of life, higher education institutions view online technology and social media tools as a cost-effective and innovative solution to enhance student performance, learning and satisfaction. This has ensued in the development of online, web-enhanced, blended, and hybrid courses with the use of Web 2.0 tools. Later research has also verified that integrating online technology into the classroom can create a rich and efficient learning environment, which improves student performance and learning^[2]. Facebook, Instagram, Twitter, LinkedIn, YouTube and Google+ are typical examples of social media tools of the Web 2.0.

There is no second opinion in the claim that digital social media in the last few years have completely transformed the scenario of human interaction and the individual's interaction with society. Digital social media provide individuals and communities the opportunities to communicate beyond defined boundaries across the globe in case of humanitarian crises like Haiti or mass mobilizations like Arab Spring^[3].

The European Commission (2002) report defines lifelong learning as "a continuously supportive process that stimulates and empowers individuals to acquire all the knowledge, values, skills, and understanding they will require throughout their lifetimes and to apply them with confidence, creativity, and enjoyment in all roles, circumstances, and environments"^[4,5].

The field of health care is fairly diverse and rapidly changing. The knowledge and skills attained at the end of formal undergraduate and

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postgraduate professional medical education are not sufficient to maintain competence and performance throughout the career. Practitioners are required to be effectively participating in organized continuing education programs such as CMEs (Continuous Medical Education) or CPD (Continuous Professional Development) or through individual learning activities^[6]. The ubiquitous invasion of social media in personal and professional lives also found its way into the toolboxes of students, residents, physicians, and educators all over the world^[7].

In this context, Medicine 2.0 and e-Health are two tools extensively used in the last five years. e-Health primarily involves the computerization of medical services such as remote surgeries by using a surgical robot or provision of digital educational support for students and residents, while Medicine 2.0 has developed a new system of doctor-patient relationship to provide medical information to patients through new web technologies with an aim to promote health education^[8]. However, as the medical profession is notorious for slow take-up of all new technologies^[9], it is hypothesized that in spite of the growing use of social media by health care professionals, medical education hitherto has not assimilated these tools at all levels, especially integrating social media use in form of CME/CPD credit or score.

The purpose of this review is to examine recent literature in the use of social media as a learning tool for lifelong learning, followed by a discussion of the emerging role of social media in medical education. The article also aims to explore various factors affecting the use of social media in medical education.

HISTORY

When the concept of lifelong learning was first developed in the early 1970s, it was propagated by international organizations like The United Nations Educational, Scientific and Cultural Organization (UNESCO), The Organization for Economic Cooperation and Development (OECD), the World Bank and two European regional organizations, first the Council of Europe and then the European Union (EU). In the 1990s, the concept of lifelong learning resurfaced again with emphasis on lifelong learning as a foundation of strong human capital. Unlike the initial phase in the 1970s, this new concept in the 90s was embraced both by governments of the western countries and industries^[10].

The development of modern social media tools has assisted people to learn anywhere, anytime and is currently linked to many useful activities that can assist in learning. Such examples of freely available products that are commonly used and interlinked with

each other include:

- Search tools: Google, Wikipedia, and YouTube
- Network tools: Facebook, LinkedIn and Twitter
- Communication tools: e-mail, Google Wave and Skype
- Sharing resources: Google Calendar and DropBox
- Sharing experiences by blogging or podcasting: Posterous and Audacity.

CME is the term used to provide up-to-date knowledge and skills to physicians about their specialty, subsequently the term CPD was introduced, as it was realized that health professionals needed to learn other skills beyond those related to their field or specialty, namely managerial, personal and social skills^[11]. Social media is perceived to have significant potential to aid educators, physicians and students for enhancing their learning experiences through customization, personalization, and greater opportunities for networking and collaboration^[12].

Due to the wide range of social media applications, it is not possible to present an exhaustive list, however a few samples of applications of social media from different perspectives are:

- Educational and research resources: *e.g.* PatientsLikeMe and Medpedia
- Evolving technologies: *e.g.* mobile applications for monitoring of vital signs and chronic conditions, portable ultrasound and smart glucometers
- Bio-statistical applications: *e.g.* medical research analysis, tracking health information, consulting charts, statistical data or even electronic health records
- Social networking: *e.g.* Doctors hangout, LinkedIn, instagram, twitter and research gate

Those are currently used not only to interact with the public to promote health, but also connect researchers and educators with ease to share and advance their research and access knowledge and expertise.

The utilization of social media has generated concerns, *e.g.*, in Wikipedia, content is posted without undergoing rigorous academic peer review, and the sheer abundance of the shared content results in information overload. Uses of social networks and Web 2.0 technology have also raised issues pertaining to medical professionalism, with reports published on incidents of posting unprofessional content online^[13].

LITERATURE REVIEW

A search was conducted using the electronic databases of British Education Index (BEI), MEDLINE, CENTRAL, ERIC, PubMed, CINAHL Plus Full Text, Academic Search Complete, Alt Health Watch, Health Source, Communication and Mass Media Complete, Web of Knowledge, ProQuest, Web of Science and

Google Scholar. Articles were identified using the terms 'lifelong learning', 'informal education', 'social media', 'medical education', 'continuous medical education' and combination of key words such as 'social media' AND 'lifelong learning', 'social media' AND 'medical education'. Key words in combination with variations of the terms such as 'social network', 'Facebook', 'Web 2.0', 'Weblog', 'blog', 'Twitter', 'podcast', and 'Webcast' were also used.

Lifelong learning

European Observatory on Health Systems and Policies (2010) report stated that lifelong learning can include a formal system; where learners have little or no control over the objectives or means of learning, an informal system where learners have no control over the means and learning is incidental, and a self-directed system of learning where learners have complete control over both the objectives and means of learning. The boundaries between the three systems are not well demarcated and often overlap, but there is a general consensus that learners learn best when matched with appropriate learning methods^[6,14].

Lifelong learning can be explained on the basis of its six essential aspects: (1) it is continuous and supportive; (2) it is motivating and empowering; (3) it integrates knowledge, values, skills; (4) it spans a lifetime and is applied (practically relevant to personal and professional lives and not just for knowledge's sake); (5) it encompasses confidence, creativity and enjoyment; and (6) it applies to all roles, circumstances, and environments^[15].

Social media and medical education

Lifelong learning in medicine is part of the Physician Charter endorsed by more than 120 national and international organizations^[16,17].

In addition, documentation of self-directed lifelong learning is now a requirement for residency training, board certification, and maintenance of certification in many countries. Medical schools have introduced problem-based and self-directed learning as a part of lifelong learning in medicine^[18,19].

Access to effective public relation (PR) has been received as current wisdom within medical education. The relationship between social media, PR and learning is indeed a fundamental one. This is due to the fact that significant information about medical research from the academic sectors can be disseminated to health care professionals and the public through various PR educational techniques. In one study, a series of in-depth interviews were conducted with public relations educators to explore their perceptions of mentoring and to understand the choices they make

regarding the use of social media tools. The results showed that PR educators thought that use of social media helps to enhance their mentoring relationships by instantaneous and informal communication, and sharing resources. Challenges in the use of social media were identified as, need for time investment, opposition by people towards change, and the inability to demarcate personal and professional use^[20].

Research has revealed that YouTube content plays a significant role in e-learning, community formation and informal peer learning. There are currently numerous educational videos on Youtube on various medical topics, lectures, physical examination, surgical procedures and training courses^[21].

In a pilot study conducted on 4th year students at Penn State College of Medicine, integration of new social media tools into the curricula of two graduate-level medical humanities electives was evaluated. Social media, *e.g.* Twitter, YouTube, blogging and Skype demonstrated augmented learning opportunities and real-time communication outside the classroom. It also showed better connection with medical experts, creativity enhancement, and helped students acquire problem-solving skills and collaboration^[22].

At least 60% of medical students in the USA and over 70% in the UK use Facebook^[23,24]. They use Facebook groups for exam preparation, sharing online content, discussing clinical cases and exchange information on clerkships. In a systemic review of 16 articles on how Facebook has been integrated into medical education, the result demonstrates easy accessibility of Facebook by students and that it has been used to prepare for exams, share online material, discuss clinical cases, organize face-to-face sessions and exchange information on clerkships. However, the analysis showed that, successful learning groups seemed to be determined by pre-existent social connections and academic guidance, and studies did not use quantitative measures to correlate Facebook-based learning with scores in high-stakes exams or clinical competency^[25]. In a survey conducted on 142 students to identify health professional students' use and behaviors with social media, Facebook and YouTube were utilized for educational purposes by 97% and 60% of participants respectively; and 85% believed that social media could benefit their learning activities^[26].

Twitter is a microblogging that seems popular for learning purposes. In 2009, 65 million individuals used Twitter around the world, a 14-fold increase compared to the 2008 ComScore^[27]. Twitter's continuous rise is mainly among those less than 34 years old^[28], and currently there are 288 million monthly active users, 80% of them are on mobile devices and 77% of them from

outside the USA^[29]. Individuals can post comments, pictures, and links to sites, articles and videos. Twitter has the advantage to interlink with other social media platforms such as Facebook, LinkedIn, Instagram, YouTube and others. In a study aimed to demonstrate a supplement to a curriculum using educational “push technology” in mobile devices, a curriculum consisting of high-yield ultrasound concepts was developed on Twitter @EDUultrasound daily. Followers received tweets “pushed” directly to their mobile devices. After the end of the year, a majority of followers (55.6%) were first time Twitter users. The majority of participants (88.9%) found Twitter user-friendly, while most (81.5%) found the information useful^[30].

In 2013, Cheston and colleagues reviewed various strategies for incorporating social media in medical education. Seventy-one percent of included studies used social media tools for learner engagement, while 57% used it for feedback and 36% for collaboration and personal development. The most commonly quoted challenges were technical issues (43% of studies), variable learner participation (43% of studies), and privacy concerns (29% of studies)^[7,13].

Hamm and colleagues reviewed 96 studies in social media use by health professionals and trainees. Discussion forums were the most commonly studied aspect (44.8%). Facebook, YouTube and Twitter were the preferred and commonly used platforms (23/96, 24%). Seventy percent (66/96) of the studies were in education rather than health practice, and nearly all interventions were on students or residents. In 61.5% (59/96), the purpose of the studies were to facilitate communication, 42.7% (41/96) were to evaluate knowledge, and 20.8% (19/96) were in skills. Moreover, quantitative studies represented 56.3% (54/96) whereas qualitative represented 21.9% (21/96) of the studies. Of note, the review found only 13 effectiveness studies, where social media tool was used as one component of a complex intervention. Similarly, only half of the effectiveness studies reported statistically significant findings^[31]. Another recent advancement is its increasing use during health conferences. A research revealed that of the 212 speakers at the International Conference on Emergency Medicine (ICEM) 2012, 41.5% possessed a LinkedIn account while 15.6% were on Twitter. More than 400 people tweeted about the conference, yet only 34% of them were physically present at the conference. Of the tweets produced, 74.4% were related to the clinical and research material of the conference^[32]. A similar study on using Twitter at the 2013 Canadian Conference on Medical Education (CCME) showed that Twitter was mostly used to facilitate discussions and dissemination of useful information^[33].

It is clear that using live feed hashtags (#) during conference events, Twitter facilitates sharing ideas and learning even with individuals that are not present. It also enables discussion for even months after the event. Different articles tweeted by attendees can be accessed directly by professionals in education, medicine, public health *etc.*, and needless to say patients.

Another dynamic use of social media is in facilitating medical and public health professionals to respond to disasters in a better way^[34]. Immediately after the 2010 Haiti earthquake disaster, social media was the main source of information for people around the globe, and texting through mobile phones raised \$5 million for the American Red Cross in the first 2 days. Google Maps, My Space and Facebook proved to be the main sources to share information, donate money, and offer comfort and support^[35].

DISCUSSION

There is a consensus in literature that social media is increasingly used both for formal and informal lifelong learning in general and in medical education. Traditionally, professionals learn about published works in the literature and share research at meetings. Social media has revolutionized this in essence, as members of the public, researchers and scholars are currently able to share knowledge and interact without meeting or prior engagement. Many organizations, regulatory health professional bodies, associations, and journals are participating in social media and helping students and professionals to remain updated and keep abreast of new advances.

Facebook and Twitter both have reached more than 1 billion users worldwide^[36,37]. Such a rise in the use of social media heralds the fact that the current structures of education could undergo significant transformation over the next decade. Social media tools also appear to have a potential role to empower students and healthcare professionals with a large pool of learning materials, mobilize educational resources and enhance learning experience, particularly in poorly resourced areas.

On the other spectrum, social media is not the panacea for all obstacles accompanying lifelong learning in medical education. Students and residents should remember that the most important learning experience in a physicians' life takes place not only behind the screen, but also in practical and clinical settings.

Ministries of health have shown efforts at using Twitter and Facebook for public health promotion^[38,39]. It has also been used for sexual health education programs^[40], emergency preparation^[34], and sharing reliable sources of information and responding to

public concerns during outbreaks^[41]. Therefore, educators and students can effectively utilize social media tools to collaborate with local and global organizations in their efforts.

Goktalay showed that faculty members having less experience with social media showed much higher self-concerns. A similar situation exists in medical education: current trainees and medical students born after 1980 are considered as digital natives, as they grew up in a world where using technology, computers, the Internet, text messaging, blogging, and SMS text messaging was a norm^[2]. In contrast, older faculty trained before 1980 are considered digital immigrants, because they experience a challenge in adapting to the demands of the digital age^[42].

Communication in and out of the medical profession can promote lifelong learning, research, advocacy and patients care. Information dissemination is considered a vital characteristic and function of social media. Social media tools such as Twitter can effectively be used for rapid retention and dissemination of information.

Research studies reviewed for this paper showed an escalating use of social media tools by students and health professionals, but this usage has yet to be properly integrated to the current existing frame work for CME/CPD. Most of the studies incorporated in this review have utilized qualitative measures and only limited rigorous quantitative studies measuring the effect of social media tools on learning. Similarly, the number of social media studies is limited to continuing education and professional development. The same observation applies on social media use, vis-à-vis confidentiality and professionalism.

The overwhelming expansion of online resources demands scrutiny of the quality, appropriateness of the content and professional conduct. In this regard, several organizations have published guidelines on professionalism in the use of social media for students and professionals^[43-45]. Nevertheless, social media like any other online technology should be perceived as a tool that is neither inherently good nor bad^[24].

CONCLUSION

Social media tools encourage passive learners to become active learners through an attitude of sharing and interacting far more than an attitude of retrieving. Research suggests that adult and young learners tend to approach social media and information and communication technology use differently. This calls for setting up appropriate education programs utilizing social media tools, both for formal and informal lifelong learning. Participation in these kinds of learning activities positively affects professional development, and social networks may provide

different types of social capital for professionals, as social media channels are increasingly becoming another venue in which educators can communicate with their students. Therefore, steps should be taken to increase online literacy and train educators on how to use various tools such as Twitter, Facebook, LinkedIn, and YouTube.

CME/CPD initiatives must endeavor to integrate innovations like social media as its core component. We need rigorous, quantitative evidence about how health professionals and students in different clinical contexts actually use social media in their everyday practice. What types of professional-patient communication are evolving online? Studies providing evidence about the effectiveness of using social media to engage the public, provide service, and disseminate useful information are also required. One future direction may be the use of data from Twitter and Facebook for research.

At the heart of the social media in lifelong learning is the evolving interconnected relationship between different social media platforms, *e.g.* Facebook, Instagram, Twitter and YouTube *etc.* despite each social network platform undoubtedly encompassing its own particulars. Many participants and users seemingly are maintaining their presence in multiple social media platforms to engage in social and learning activities. In this context, more robust studies are required to objectively assess if different aspects of identity and learning activity are exposed on different social media platforms.

The evidence presented shows how social media has clear potential to contribute in lifelong learning and medical education, and there is a need to give recognition both to how social media technology can support learning as well as participation in a workplace.

Practice Points

- There is a consensus in literature that social media is increasingly used both for formal and informal lifelong learning in general and in medical education.
- The escalating use by students and health professionals has yet to be properly integrated to the existing framework of CME/CPD.
- The number of social media studies is limited to continuing education, professional development, confidentiality and professionalism.
- Many participants are maintaining their presence in multiple social media platforms to engage in social and learning activities. Robust studies are required to assess if different aspects of identity and learning activity are exposed on different social media platforms.

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