

Facebook as a Learning Environment for Teaching Medical Emergencies in Dental Practice

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ABSTRACT

Background: Social media can be part of the formal education of health professionals and in their lifelong learning activities. The effectiveness of Facebook, an online social medium, application for educational purposes was evaluated in this study. It was used to serve as a teaching medium of a course in medical emergencies in dental practice (MEDP). **Methods:** Syrian dental students were invited to join a Facebook group “Medical emergencies in dental practice” during the second semester of the academic year 2013–2014. The group privacy settings were changed from an open group to a closed group after the registration period. Administrators of the group published 61 posts during the course period, which extended for one month. Students’ progress in learning was evaluated using self-assessment questionnaires administered to the students before and after the course. These questionnaires also queried their opinions regarding the use of Facebook as an educational modality. Qualitative statistics, Wilcoxon signed ranks and Mann-Whitney U-tests were used to analyze the data. **Results:** Out of 388 students registered in this course, 184 completed it. Two-third of students agreed that Facebook was useful in education. Their impressions of this course were 17.4% as excellent, 52.2% as very good. *P* values of the self-assessment questions of Wilcoxon signed ranks test were <0.001, indicating self-assessed improvement in MEDP skills. **Discussion:** Facebook as a social medium provides a unique learning environment. It allows students to discuss topics more openly in a flexible setting with less rigid time and place constraints. In the light of this study it was found that Facebook may be useful in teaching medical emergencies in dental practice in its theoretical aspect.

Keywords: Dental students, Facebook, medical emergencies, social media, teaching-learning, Web 2.0

Background

The World Wide Web 2.0 depends on the collaborative work of many content creators, which has enabled social media such as Facebook and Twitter, video sharing sites like YouTube and interactive websites, including blogs and wikis.^[1] With its rapid growth and accessibility, the social media today has created a wide spectrum of new uses and has fundamentally changed the way people manage information.^[2] Social media

initially provided a mean for socialization, but are increasingly harnessed for educational purposes. Recent studies have found that incorporating social media tools into traditional educational environments increases student learning and collaboration.^[3] Moreover, it gives educators the possibility to reach their students in new and innovative ways unrestrained by time and space. It also holds the promise in adding value to teaching and learning in higher education, while still enjoying the excitement generated by the invention of the World Wide Web.^[4]

Facebook can be seen as an instant virtual communication world through which one maintains contact with family and friends. It is commonly used among health science students,

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residents and dentists in western countries.^[2,5-8] Furthermore, many students have turned to Facebook instead of university online learning sites in order to organize and participate in study groups.^[9] An earlier study found that the use of social media can be implemented among dental students to include topics sometimes not covered in a dental school curriculum, to expand students' perspective, and to satisfy the need for lifelong learning.^[10] According to Sweet *et al.*, dental students have utilized Facebook applications to prepare one another for objective structured clinical examinations (OSCEs).^[11] Moreover, Ipsos MORI, a leading market research company in the UK, found that 37% of first-year UK students were using these sites to discuss coursework and 81% of these students found such activity useful for learning.^[12] However, its application for educational purposes has not been well evaluated by educators^[13] and should be further studied.^[14]

In the Faculty of Dentistry-Damascus University, medical emergencies in dental practice (MEDP) is taught within other subjects, principally a course on minor oral surgery. The annual examination of "The Center of Measurement and Evaluation in Higher Education"^[15] for graduates of all dental schools in Syria revealed that they generally lack knowledge of this topic. The internal social unrest and instability in Syria, which started in 2011, make it difficult to hold educational courses.

Accordingly, an online presentation of contemporary topics was conducted on a Facebook group to address the goals of maintaining competence in medical emergencies among dental graduate and undergraduate students.

Methods

In this study, Facebook (www.facebook.com) was used to teach medical emergencies. All investigators of the present study had a Facebook account specifically created and used for this course and evaluation. To avoid biasing the participants, the usernames did not reveal authors' actual names but rather identified them as the administrators of the group. An open "Group" was created under the name of "Medical Emergencies in Dental Practice." Joining the group was optional and materials presented or discussed within the group were not part of the curriculum and would not affect students' marks (grades) in anyway. The course content along with the group URL and joining instructions were announced among the Syrian Universities' dental students.

To accept the requests, students were asked to complete an online questionnaire created with Google Drive® to assess students' skills in MEDP before the course. The questionnaire contained 29 knowledge-based self-assessment questions related to MEDP. Each question was rated as very good, good, fair and poor, scored as 3, 2, 1 and 0, respectively. These questions are presented in Table 1, which also includes the results of

Table 1: The mean scores of the primary first self-assessment question and the second self-assessment questions and the results of Wilcoxon signed-ranks test (in descending order of absolute difference)

Question	First SA	Second SA	Difference
Q7: Usage of the resuscitations mask	0.53	1.62	1.09*
Q4: Assessment of the victim's airway	0.99	2.03	1.04*
Q19: Management of angina pectoris	0.8	1.83	1.03*
Q10: Administration of oxygen enriched ventilation	0.69	1.67	0.98*
Q18: Managing of asthma	1.12	2.09	0.97*
Q22: Management of hyperglycemia (ketoacidosis)	1.16	2.11	0.95*
Q6: Management of conscious choking	1.02	1.95	0.93*
Q8: Performance of mouth-to-mouth ventilation	0.84	1.72	0.88*
Q25: Management of anaphylaxis shock	0.78	1.66	0.88*
Q11: Assessment of the victim's circulation	1.06	1.9	0.84*
Q23: Management of shock	0.8	1.59	0.79*
Q13: Usage of automated external defibrillator	0.26	1.01	0.75*
Q29: Appropriate stress reducing protocol	1.59	2.33	0.74*
Q28: Recognition of anxiety and dental fear	1.83	2.48	0.65*
Q1: Recognition of persons at high risk for medical emergencies	1.48	2.1	0.62*
Q20: Management of hyperventilation	0.63	1.71	1.08*
Q5: Management of unconscious choking in adults	0.68	1.72	1.04*
Q26: Management of reaction to local anesthesia	0.78	1.78	1*
Q17: Management of epilepsy	0.91	1.88	0.97*
Q15: Management of myocardial infarction	0.74	1.69	0.95*
Q9: Performance of cardiopulmonary resuscitation	0.89	1.82	0.93*
Q16: Management of stroke or cerebrovascular accident	0.20	1.13	0.93*
Q24: Managing adrenal crisis (cortisol deficiency)	0.3	1.18	0.88*
Q21: Management of hypoglycemia (hyperinsulinism)	1.45	2.31	0.86*
Q14: Possession of basic emergency drug kit	1.53	2.34	0.81*
Q27: Taking an appropriate medical history	1.8	2.59	0.79*
Q12: Management of cardiac arrest	0.67	1.41	0.74*
Q2: Recognition of unconsciousness	1.6	2.31	0.71*
Q3: Activation of emergency medical system	1.59	2.23	0.64*

*P<0.001. SA=Self-assessment questions, Difference=Second SA first SA

Wilcoxon signed ranks test. In addition, this questionnaire contained questions about their regular Facebook use habits and their perspectives and expectations of the course. The registration period was initially from 30-3-2014 to 6-4-2014. It was extended an additional week (until 10-4-2014) after which the group privacy setting was changed to a closed group. The course started on 6-4-2014. It was decided that the group administrators would only see Facebook profile information made available through each student's privacy settings, and they would not become Facebook friends with students during the course. Students (members) were only allowed to "like" and/or comment as much as they wanted on posts, whereas only the administrators could post on the group. These instructions were to maintain the scientific nature of the group without affecting its social nature. Out of 477 join requests, 388 completed the primary questionnaire and became members according to the acceptance criteria. Students were not required to make a specific number or type of comment or likes to the Facebook group, or even

to participate. While it may have reduced some students' exposure to shared content, this leniency was necessary to maintain the social and voluntary nature of the activity.

A mixture of spoken and formal Arabic language was used in the posts. Posts were added on almost daily basis. By the end of the course, there were total 61 posts providing a fundamental overview on basic life support (BLS) and management of common medical emergencies. Student-student and student-administrator interactions were through likes and comments. Some students also contributed with pictures and information through comments.

After completing the course, students were asked to complete a second questionnaire. It contained the same knowledge-based self-assessment questions along with other questions regarding their opinions of this experience. Those who returned both questionnaires were given certificates of completion.

Statistical analysis included descriptive analyses for students' responses about the course. In addition, Wilcoxon signed ranks test was used to evaluate students' self-rated improvement in the given material. Mann-Whitney U-test was used to compare progress in learning between two subsets of students. Finally, Fisher exact test was used to test for the relationship between categorical variables. SPSS version 21 was used for analyses. P value of 0.05 or less was considered significant.

Results

The Facebook group consisted of 388 students; that is those who volunteered to participate, were found eligible, and completed the first questionnaire. Students of Damascus University comprised the majority (87.6%, Table 2). A total of 184 students (47.4%) completed both questionnaires. Males comprised 59.8% of those who completed both questionnaires.

To the first questionnaire prior to the course (388 responses), 73.1% students indicated that the importance of the subject was the primary reason for joining the group, followed by an interest in interactive learning (32.1%). Students stated that they had previously used Facebook principally to follow university news. Two-third of students agreed that Facebook was useful in education; however, only 57 (14.7%) had participated in previous electronic courses, which had generally not been related to dentistry (76.9%). Although one-third had previous experience in first-aid procedures, only 13.4% stated that they were capable of applying these skills into their practice.

After completing the course, out of 184 respondents to the second questionnaire 17.7% responded that their impressions

of the course were excellent, 52.2% as very good, 27.7% as good and 2.7% responded as fair. No differences in impressions of the course were found between males and females ($P = 0.48$) or undergraduates and postgraduates ($P = 0.15$). Most (78.2%) students reported that they had visited the group during their usual use of Facebook, which was either every day or on weekends. The majority of students (89.3%) who reported that they registered for the course due to the importance of the topic indicated that they had read more than half of the posts during the course. The students' opinions regarding use of Facebook for educational purposes did not change after finishing the course. About 70% of those who participated in previous courses found that this course is similar in general to other electronic courses.

The number of "likes" on each post ranged from 22 to 88, whereas the number of comments ranged from zero to 29. Posts pertaining to BLS skills and cardiopulmonary resuscitation (CPR) garnered the most online interaction: 38.1% of the students reported that they had read 75-100% of the posts on these topics, and 35.9% reported that they had read 50-75% of them. The students responded to posts by asking for further explanation, giving examples and discussing viewpoints.

Table 3 presents students' evaluation of their interaction with group's administrators. Nearly all students (97.2%) stated that Facebook facilitated the communication between the group administrators and students. 90.7% of students found that the

Table 2: Students' distribution according to the university and stage

University	Damascus university	Other universities	Total
Undergraduates	289	31	320
Postgraduates	51	17	68
Total	340	48	388

Table 3: Students' evaluation of the interaction between students and the group administrators through Facebook

Opinions	Frequency (%)
Excellent and very good	38
Good	45.7
Fair or poor	16.3
Total (n=184)	100

Table 4: Students' opinions on applying Facebook to learning other subjects

Opinions	Frequency (%)
Completely reject	3 (1.6)
Do not prefer	13 (7.1)
Do not mind	74 (40.2)
Prefer for some subjects	70 (38)
Prefer for many subjects	24 (13)

course was very valuable. Moreover, 92.8% encouraged the use of electronic learning in dentistry. The opinions of students toward applying this teaching method for other subjects are presented in Table 4.

The improvement in the students' skills scores, through comparing pre-post self-assessment questions, ranged from 0.62 to 1.09, which indicated approximately one-score shifts in their skills in MEDP. This improvement was statistically significant by the Wilcoxon signed ranks test (P values < 0.001) for all questions [Table 1]. The reported improvement was highest for some BLS procedures and the management of common medical emergencies.

We compared improvement in males' and females' skill scores, and no statistical difference for any of the 29 questions was found (P -values ranged from 0.079 to 0.96). However, undergraduates improvement was greater than that of postgraduates in questions 3, 4, 10, 17, 18 and 29.

Discussion

The remarkable improvement in technology has made communication easier than ever before. People spend a great deal of time on communication. Social media represents a fundamental component of the modern communication. Its internet applications have a lower barrier when it comes to entry into the education environment. As they are free of charge, they do not require high technological skills and they are easily accessed via the internet.^[16]

In the current study, Facebook was incorporated to serve as an educational medium for the delivery of a medical emergencies course. Gray *et al.* conducted a survey in 2008 of Facebook's use among Australian medical students and suggested that Facebook could be leveraged for educational purposes.^[9] Information from the initial questionnaire in the current study revealed that using Facebook for educational purposes was positively accepted by students. This is further corroborated by the responses of the second questionnaire, which confirmed that using Facebook in this course was found to be a valuable experience. This is consistent with George and Dellasega findings, though other social media were evaluated in their study.^[3] Course attendance in the current study was made optional and had no effect on the student's marks. To encourage students joining the group, an important subject (MEDP) was chosen, and certificates were given at the end of the course to those who completed it. On the other hand, the course was an opportunity for the students who were eager to learn aspects of medical emergencies for free. The majority of students joined the group because of their passion for learning and not for the extrinsic motivation of getting the certification. Nevertheless, the dropout of about half of the students before completing the course could be

explained by the absence of extra credit, and the optional nature of this activity.

In the current study, students were under no pressure to offer positive comments, because course directors identified themselves as administrators rather than using their names, and there were no posting/commenting requirements as this would have affected the students' attitude toward the activity, they might have only satisfied the minimum requirements and their participation would not have been so thoughtful. This would have also affected the Facebook nature in which students tend to consume more online content than they share.^[17]

Inappropriate use of social media, challenges and limitations such as concerns about the privacy and lack of facility with technology should not be overlooked.^[3,8,18] One study found that some students preferred to keep their Facebook account private and away from the academic staff.^[11] In addition, that study found that some students preferred Facebook to remain a separate study space inaccessible to academic staff. These students preferred to keep their Facebook profiles private and did not wish to be pressured to "friend" their professors.^[9,11] However, in the current study the privacy issue was overcome, as there was no need for the students to be "friend" with the administrators. Another concern is associated with communicating harmful or incorrect advising or information^[19] especially when students interact with each other or when answering question. This concern was addressed by correcting students' answers and monitoring information quality and by not allowing students to post to the whole group. On the other hand, eye contact between lecturers and learners is absent in such teaching ways. Nevertheless, 87.2% of students in our course stated that Facebook facilitated the communication with the administrators based on the second questionnaire.

According to the primary questionnaire, the importance of this subject (MEDP) was the primary reason for most to attend this course. As it is the dentist's ultimate responsibility to effectively manage medical emergencies^[20] and provide BLS, it is also the most important contribution the dentist can give until the definitive treatment can be provided.^[21] Wilcoxon signed ranks test for the self-assessment questions revealed perceived improvement in the students' skills in MEDP. Undergraduates' progression was better than postgraduates' for some questions. Perhaps these particular questions assessed more common conditions that postgraduates had more often faced than their counterparts.

One limitation of the current study is the short period of the course (one month). The academic semester typically lasts for 3-4 months. In addition, the course was limited to the theoretical aspects of MEDP, which does not enable students to involve MEDP skills into their practice. However, practical training cannot be achieved virtually. Despite the fact that this

course has only covered-learning for a single subject, it still gives an indicator that with the lack of the capabilities and funding sources and the unstable conditions, such method could be an alternative accessible option.

As the scientific knowledge in dentistry is doubling every five years,^[22] continuous learning (life-long learning) through social media may be a good medium for practitioners to update information and discuss clinical cases with colleagues.^[23] This may be investigated through future research.

Conclusion

Facebook (as a social medium) provides a unique learning environment. It allows students to discuss topics more openly in a flexible setting with less rigid time and place constraints.

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Conflicts of interest

There are no conflicts of interest.

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