Does the Facebook have Effectiveness on Education of Iranian Students?

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Abstract

Aim: Considering the lack of studies on social networking websites in Iran, this study aimed to assess the effectiveness of Facebook in training of tooth preparation to dental students. Methods: 78 students of preclinical course divided into two groups of control and intervention. The control group (n=42) was educated at first and by traditional method. Following the control group, intervention group (n=36) received instruction via the Facebook as an adjunct. Students in the intervention group were acquainted with a page in Facebook posting educational topics for instruction of tooth preparation. After finishing of tooth preparation period, students of two groups participated in tooth preparation test. The quality of tooth preparation was scored according to a checklist with maximum total score of 20; and compared between the two groups of intervention and control. Statistical analysis done by three strategies included Intention to Treat (ITT), Per Protocol and Per Treatment. Regression analysis was performed to assess the presence of statistical association between the intervention received and the student scores ($p<0.05$). Results: Base on ITT analysis, the mean score of tooth preparation acquired by students was 17.81 ± 1.60 in the intervention and 16.76 ± 1.79 in the control group. The mean score of students in the intervention group was significantly higher than that of control subjects ($p=0.009$). Conclusions: It can be concluded that education by Facebook as an adjunct to traditional instruction can significantly improve the student scores. Sex had no significant effect on the effectiveness of this intervention. 44% students became the members of Facebook.

Key Words: Dental education, Prosthodontics, Tooth preparation, Social networks, Iran

Introduction

Social networking websites are a group of online social media where people build social networks or relations in order to talk and share interests and activities. Most social networks allow their users to participate in discussions and polling, leave feedbacks or comments and share information [1]. Sharing information in large groups creates a sense of cooperation and collaboration among people with the same profession and provides opportunities for future cooperation [2]. Evidence shows the popularity of social networking sites among students. Many students use these websites to improve their knowledge. Caruso and Salaway showed that 47.9% of American university students used social networking sites for educational and work-related communication with their peers and colleagues. Ipsos reported that 37% of junior (first-year) university students in the UK used social networking sites for educational purposes and 81% of them used social networking sites to improve their level of learning [3].

Facebook is a social networking website with over 1billion users worldwide. People use Facebook to share pictures, videos, opinions and experiences [4]. Facebook, first developed for use by the American college students, is now free for the public and about half the Facebook users log into their Facebook account at least once a day [5]. In 2008, Salaway et al, in their study concluded that 47.9% of students were in touch with their peers via the social networking sites irrespective of their field of education [6]. Considering such high percentage, Gray et al. assessed the possibility of using Facebook by medical students for educational purposes [3]. Their results showed that most students preferred participation in educational groups in Facebook rather than using online education university websites. Gray et al. discussed that inadequate knowledge of students participating in these groups was an obstacle against the potential capacity of social networking sites and called for greater participation and supervision of instructors. However, some students prefer not to get involved with educational topics on Facebook and did not like to make friends with their instructors or faculty members of their university in social networking sites like Facebook. Sweet et al. reported that a large number of dental students used Facebook for preparation for Objective Structured Clinical Examination (OSCE) [7]. However, evidence shows that both high school and university students prefer using Facebook for social relations, making friends and getting to know other people rather than for educational purposes [8,9].

Recent studies focusing on the use of Facebook by medical students in Britain showed that 70.8% of students were Facebook members [10]. Another study reported that 64.3% of medical students in an American medical college had Facebook accounts [11]. Using Facebook for educational purposes by English medical students has been reported in several studies [12]. However, information regarding efficient use of social networking sites for medical education is scarce. Facebook may be able to provide students with useful information regarding professional websites in the field of medicine and guide them towards more efficient learning, continuing education and professional communication. Sanders and Haythornthwaite in 2007 highlighted the role of social networking sites in medical education but added that the path towards this goal was obscure [10].

Despite many advantages, the efficacy of Facebook for learning has yet to be confirmed. Use of Facebook may eliminate the borders in social relations and this may serve as an obstacle against instruction [13]. Conventional methods of using Facebook by students may eliminate or undermine the role of instructors in education [14].

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Dental students in Iran graduate after 6 years of dental education. One of the most important fields in dental education is prosthodontics, divided into removable and fixed prosthodontics. Prior to the clinical courses, dental students participate in preclinical courses for practice on mannequins to gain adequate knowledge and expertise for working on actual patients. In preclinical course dental students are divided into smaller groups and learn dental skills face to face and via live demonstration from an instructor. After each session of education, students practice on phantoms. During two-month student are trained step by step to fabricate a 3-unit FPD. This method of instruction has been used for training of dentists for many years and is in need of some modifications. The drawbacks of the traditional method of instruction include its dependence to instructors, possibility of missing some important topics, observing the process of prosthesis manufacturing from one direction only, impossible repeatability and multiplicity of techniques taught within a single session.

Considering the role of social networking websites in people's daily life, they have affected medical and dental instruction as well. On the other hand, several studies that assessed e-learning via the social networking websites for medical and dental education and evaluated its role as an adjunct to traditional classroom-based learning; have not reported conclusive results [15-23]. The question of this study is "If Facebook as a filtered social network has effectiveness in education of tooth preparation in Iranian student?"

Materials and Methods

This case control study was conducted on 78 dental students (female=45, male=33 / age: 20-22 years old) who took the preclinical course of fixed prosthodontics. They were divided into two groups of control and intervention. The control group (n=42) was educated at first and by traditional method of instruction and after finishing the period of tooth preparation; they participated in tooth preparation test.

Following the course of the control group education of intervention group (n=36) was started and they received instruction via the Facebook as an adjunct to traditional instruction. In an explanatory session held by the researchers, students in the intervention group were acquainted with a page in Facebook posting educational topics for instruction of tooth preparation. Membership in this group was voluntary and those who were not interested, received traditional instruction only. Films, images, scientific information and practical instruction all regarding tooth preparation steps were all posted on this page step-by-step according to preclinical training program. Students were free to post their questions on the page and receive responses from the instructors. 16 out of 36 students, used topics shared in the social networking website and comprised the actual intervention group of this study. After finishing the preparation period, they participated in tooth preparation test.

Table 1. Tooth preparation checklist.

Sl. No.	Checklist Parameter	Check/Uncheck
1	Planar preparation of occlusal surface	
2	Functional cusp bevel	
3	Adequate occlusogingival length of tooth after preparation	
4	Tapered preparation of mesiodistal walls (absence of over-tapering)	
5	Tapered preparation of buccolingual walls (absence of over-tapering)	
6	No undercut in preparation of mesiodistal surfaces	
7	No undercut in preparation of buccolingual surfaces	
8	Adequate preparation in all areas to provide adequate restoration strength	
9	Chamfer finish line at the gingival level	
10	Adequate depth of chamfer finish line	
11	Adequate depth of shoulder	
12	Adequate location of shoulder	
13	Adequate length of bevel	
14	Adequate angle of bevel	
15	Uniformity of finish line	
16	Absence of sharp corners	
17	Appropriate location of wings	
18	Appropriate shape of wings and absence of undercuts	
19	Two-planed buccal surface preparation	

20	No damage to the adjacent teeth or the gingival tissue	

Final score of students in the course was used as a criterion to assess the effectiveness of intervention. The educational content and the instructors were the same in both groups and they were calibrated. The quality of tooth preparation was scored by instructors according to a checklist blindly and compared between the two groups of intervention and control. The checklist included 20 requirements of an ideal tooth preparation and one score was allocated to each item yielding a maximum total score of 20 (*Table 1*).

Statistical analysis done by SPSS 21.0 (SPSS, Inc., Chicago, IL, USA) and three strategies included Intention to Treat, Per Protocol and Per Treatment. Regression analysis was performed to assess the presence of statistical association between the intervention received and the student scores. ANOVA was used to compare the two groups ($p<0.05$).

Results

Of 36 students in the intervention group, 16 signed up in Facebook, liked the page and watched the videos and used the educational contents. Of the remaining 20, 12 used the contents of the page without becoming a member in Facebook.

For the intention to treat (ITT) analysis, two groups of intervention and control according to the primary classification were compared irrespective of the fact that who actually received the intervention (*Table 2*). Comparison of the two groups according to ITT analysis by ANOVA revealed a P value of 0.009 and a standard error of 0.39, indicating a statistically significant difference in the mean scores between the two groups of intervention and control. To compare the effectiveness of intervention between male and female students, the P value was found to be 0.98 with a standard error of 0.79; which indicates an insignificant association and shows that the effectiveness of intervention was not different between male and female students.

Table 2. *Frequency of subjects in each group according to the ITT analysis.*

		Mean	**Standard deviation**	**Number**	**Gender**
ITT Group	Control	16.76	1.79	42	Male (17=40.5%)
					Female (25=59.5%)
	Intervention	17.81	1.6	36	Male (16=44.4%)
					Female (20=66.6%)

For per protocol analysis, the intervention and control groups were determined based on compliance to the intervention. A total of 16 subjects in the intervention group used educational contents posted on the Facebook group created for this purpose. This group of students represented the intervention group in per protocol analysis (*Table 3*). Comparison of the two groups according to per protocol analysis by ANOVA revealed a P value of 0.035 and a standard error of 0.51; which indicate a significant difference between the mean scores of the control and intervention groups. Comparison of the effectiveness of intervention between male and female students revealed a P value of 0.83 with a standard error of 1.07. This P value indicates an insignificant correlation and shows that the effectiveness of intervention was not different between male and female students.

Table 3. *Frequency of subjects in each group according to the Per Protocol analysis.*

		Mean	**Standard deviation**	**Number**	**Gender**
Per Protocol Group	Control	16.76	1.79	42	Male (17=40.5%)
					Female (25=59.5%)
	Intervention	17.88	1.63	16	Male (10=62.5%)
					Female (6=37.5%)

For per treatment analysis, subjects were assigned to the control and intervention groups exclusively based on receiving or not receiving the intervention irrespective of the primary random grouping. According to this analysis, 50 subjects were assigned to the control and 28 to the intervention group (*Table 4*).

Table 4. *Frequency of subjects in each group according to the Per Treatment analysis.*

		Mean	**Standard deviation**	**Number**	**Gender**
Per Treatment Group	Control	16.92	1.79	50	Male (19=38%)
					Female (31=62%)
	Intervention	17.82	1.61	28	Male (14=50%)
					Female (14=50%)

ANOVA yielded a P value of 0.03 for the comparison of actual intervention and control groups; this value indicated a significant difference between the two groups. Comparison of the effectiveness of intervention between male and female students yielded a P value of 0.56 with a standard error of 0.83. This value indicates insignificant difference between the two groups and shows that the effectiveness of intervention was not different between male and female students.

Discussion

This study aimed to assess the effectiveness of Facebook and the acceptability of this instructional modality by dental students. Facebook was chosen as a representative of social networking websites for web-based instruction. High popularity of this particular social networking website and high rate of daily visitors were among the most important criteria behind its selection for this study.

Interventional studies are commonly used in the fields of medicine to assess the effect of a method on dependent variables. Students were selected using census sampling. However, small sample size (n=78) may not yield results generalizable to other groups or populations.

An important criterion for assessing the effectiveness of instruction and learning in universities, particularly in developing countries like Iran, is the final score of students acquired at the end of the course. According to per treatment analysis, the mean score of tooth preparation acquired by students was 17.82 in the intervention and 16.92 in the control group. The mean score of students in the intervention group was significantly higher than that of control subjects. Thus, it can be concluded that despite filtering, education by Facebook as an adjunct to traditional instruction can significantly improve the scores in Iranian students. This result is in line with the findings of Cobb et al. In their study, student scores were compared before and after receiving web-based instruction and the results showed an improvement in scores after receiving web-based instruction as an educational tool [24]. Another study that is in line with current study, used a social networking website to provide continuing education programs regarding diabetes mellitus for general physicians and showed that physicians who used this educational modality were more successful in selection and administration of proper medications for blood sugar control of patients compared to controls. However, due to small sample size (n=10), the difference did not reach statistical significance [25].

Also, results showed that the improvement in scores was not significantly different between male and female students. In other words, sex had no significant effect on the effectiveness of this intervention. This shows that web-based learning is equally efficient for both genders and factors such as greater interest in use of computer or having more proficiency in computer science had no effect on the results. Similarly, a previous study on the efficacy of web-based instruction of software programming reported insignificant effect of gender on learning of students [26]. In a more recent study on students in Taiwan using a virtually simulated environment for instruction of physics, no significant difference was noted between male and female students in terms of improvement in their scores [27]. Also findings of Tantawi et al. were in accordance with current study as well [16].

Of 36 subjects in the intervention group, 16 (44%) used the educational contents of the page created in Facebook via membership. The novelty of this method, low speed Internet, restricted access to Internet in dental faculty and dormitory spaces, filtering of Facebook that need to use proxy and cultural issues are among the main reasons behind the relatively low popularity of this educational modality in Iran. Also above listed items were the limitations of current study.

By filling a questionnaire at the end of study, it revealed that 12 out of 36 students in the intervention group use educational content of this page indirectly and without membership. This event shows that totally 78% of students were interested in using extra educational materials; but above listed limitation reduced their percent. Removing some of those restrictions will increase student motivation on the use of Facebook for educational purpose in Iran.

Conclusion

It was concluded that education by Facebook as an adjunct to traditional instruction can significantly improve the student scores and sex had no significant effect on the effectiveness of this intervention.

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