ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

DOI: 10.5336/dentalsci.2020-75579

The Role of Instagram on Dental Education

Instagram Uygulamasının Dental Eğitimdeki Rolü

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ABSTRACT Objective: Technological developments affect educational processes, learning methods, and learning environments. Dentistry education should be adapted parallel with technological developments for students whose learning habits change with the increasing using of social media and mobile phones. This study aims to compare the efficacy of the mobile-based education method (Instagram application) and the traditional classroom education method. **Material and Methods:** The study was conducted with 42 volunteer students who had not taken general and oral pathology courses yet. Students (n:21) in the control group took radiological features of the odontogenic and non-odontogenic cysts and odontogenic tumors course by the classroom learning method. The study group (n:21) followed the same lessons' images on the newly opened @beuradyoloji Instagram account. Both groups were trained for 1 hour a week for 4 weeks. The knowledge test was held 15 days after the end of the courses to all students. Paired sample t-test was performed to investigate differences between the mean knowledge test scores of the groups. **Results:** The examination average for the study group was 71.97±9.3 and the control group was 68.33±8.39. Paired sample t-test showed no significant difference between the study and control groups in knowledge scores (p>0.05). **Conclusion:** The current study is the first that investigates the effect of the mobile-based education method on radiological features of the specific cysts and tumors. The study carried out on a limited number of students, shows that the value of mobile-based education has almost the same effectiveness to classroom education.

Keywords: Radiology; education; dentistry

ÖZET Amaç: Teknolojik gelişmeler eğitim süreçlerini, öğrenme yöntemlerini ve öğrenme ortamlarını etkilemektedir. Dişhekimliği eğitimi, öğrenciler için öğrenme alışkanlıkları, sosyal medya ve cep telefonlarının kullanımıyla birlikte artan teknolojik gelişmelere paralel olarak uyarlanmalıdır. Bu çalışma, mobil tabanlı eğitim yönteminin (Instagram uygulaması) ve geleneksel sınıf eğitimi yönteminin etkinliğini karşılaştırmayı amaçlamaktadır. **Gereç ve Yöntemler:** Araştırma henüz genel ve oral patoloji dersi almamış 42 gönüllü öğrenci ile yürütüldü. Kontrol grubundaki öğrenciler (n: 21), odontojenik ve odontojenik olmayan kistler ve odontojenik tümörler dersinin radyolojik özelliklerini sınıf öğrenme yöntemi ile aldı. Çalışma grubu (n: 21) yeni açılan @beuradyoloji hesabındaki aynı derslerin görüntülerini takip etti. Her iki grup 4 hafta boyunca haftada 1 saat eğitim aldı. Bilgi testi derslerin bitiminden 15 gün sonra tüm öğrencilere yapıldı. Grupların ortalama bilgi testi puanları arasındaki farklılıkları araştırmak için eşli örnek t-testi yapıldı. **Bulgular:** Çalışma grubu için test ortalaması 71.97±9.3 ve kontrol grubu için 68.33±8.39 idi. Eşli örnek t-testi, çalışma ve kontrol grupları arasında bilgi skorlarında anlamlı bir fark göstermedi (p>0.05). **Sonuç:** Bu çalışma, mobil tabanlı eğitim yönteminin spesifik kist ve tümörlerin radyolojik özellikleri üzerindeki etkisini araştıran ilk çalışmadır. Sınırlı sayıda öğrenci üzerinde yapılan çalışma, mobil tabanlı eğitimin değerinin sınıf eğitimi ile hemen hemen aynı etkinliğe sahip olduğunu göstermektedir.

Anahtar Kelimeler: Radyoloji; eğitim; dişhekimliği

Cysts and tumors in the oral and maxillofacial region in dentistry are frequently encountered and one of the most important issues. Particularly when a patient complains of a lesion or when a lesion is seen during a routine examination, it is necessary to focus on the preliminary diagnosis quickly and correct treatment and follow up method should be applied. The best way to do this process is only possible with a good education. Also, education has a vital role in preparing students to be effective and constructive

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Peer review under responsibility of Turkiye Klinikleri Journal of Dental Sciences.

Received: 17 Apr 2020 ***Received in revised form:*** 19 May 2020 ***Accepted:*** 21 May 2020 ***Available online:*** 02 May 2020

dentist for society.[1] However, limited on-the-job training is given in the faculty, lecture notes and slides given to the students may not bring the learning time to the desired levels. In addition to the lack of course time, education methods should not remain traditional in the 21st century, they should change a lot due to the rapid development of technology. In this study, a new alternative method of learning for oral radiology education via a social media tool (Instagram application) based on mobile base technology was investigated.

Instagram is a social networking service that photos and videos can be uploaded. This social networking service is created by Kevin Systrom and Mike Krieger and launched in October 2010 for the operating system phones manufactured when the first version of Instagram was launched worldwide 25,000 people were registered on its first day.[2] Today statistics show that monthly, 800 million people; daily, 500 million people share photos and videos and there are 300 million people who share stories daily.[2] The app allows photo and video uploading in such a way that users can edit these uploads with the help of various filters and add tags to them. Instagram users can view content by tagging the content of other users (e.g., #dentalradiology, #oralradiology, #oralcancer, #giantcellgranuloma, #ameloblastoma). On August 2, 2016, The Instagram stories were introduced as a new feature that allows you to share a slide show as more than one photo and videos which disappear after 24 hours. In the stories, new shapes can be added to the shares with text and drawing tools. New stories from followed users can be seen in a bar at the top of the feed, a colored ring appears around the profile photo. This feature can be used to point out to some lesions and to remind some diagnostic methods. Because of all these features of Instagram, Shafer et al. reported that Instagram is the most effective social media application in radiology training.[3]

The lesson given in educational institutions has now crossed classroom boundaries in today's technology world; social media, computers, mobile phones, and mass communication programs, among many other contributing methods, have become one of the methods of learning and acquiring information together with all daily activities. Users can add their content to feed photos and this supply an opportunity to students for enhancing their knowledge altogether. This application provides student-centered interactive learning.

Studies are reporting the relationship between social media, web-based technology, and medical education, and specifically Instagram with medical education.[4-7] But no national or international publication has been found on how much the use of the Instagram application directly contributes to the learning of dental students in the literature. The present study aimed to compare the effect of the Instagram app-based education and traditional classroom teaching method on the radiological features of the oral cysts and tumors knowledge of dental students. The null hypothesis was tested in this study:

H0. Instagram-based education is not as effective as traditional classroom education on radiological features of oral cysts and tumors knowledge.

MATERIAL AND METHODS

The study was presented to Bülent Ecevit University Institutional Review Board with the guidelines of the Helsinki Declaration as revised in 1975 and found appropriate for the method and purpose. The ethics committee approval was obtained from Zonguldak Bülent Ecevit University Human Research Ethics Committee with the conclusion 2018/02 dated 03/10/2018 and protocol no. 421. The study was conducted with 60 volunteer students who started the class 3 and had not taken the General and Oral Pathology course yet. Students who were included in the study participated voluntarily and they were informed before the beginning of the study.

Firstly, students were asked about the use of frequency for Instagram. Response options were a) never, b) less than 1 time per month, c) monthly, d) weekly, e) daily, f) multiple times per day. Only students who selected multiple times per day option were included in the study to avoid shared case posts being missed by students. Students' total number who selected multiple times per day option was 42. All students were divided into study and control groups based on alphabetical name order equally.

CONTROL GROUP

Students (n=21) in the control group took oral pathology course by classroom learning method for 1 hour a week for 4 weeks. Odontogenic and non-odontogenic cysts and odontogenic tumors such as ameloblastoma, keratocyst, radicular cyst, cementoblastoma training were given in the classroom. During the lesson, radiologic images of numerous cases were shared about these topics during the course. As in normal education, course contents were shared with students as a post-course note on computer.

STUDY GROUP

Students (n=21) in the study group were told to follow the newly opened @beuradyoloji account on Instagram (Figure 1). The same images of the odontogenic and non-odontogenic cysts and odontogenic tumors described in the control group during classroom lessons were shared on this Instagram account as case photos with the explanations below photos, within the same days of the control group courses. Apart from this one hour, no other posts were shared on the main page from the Instagram admin account.

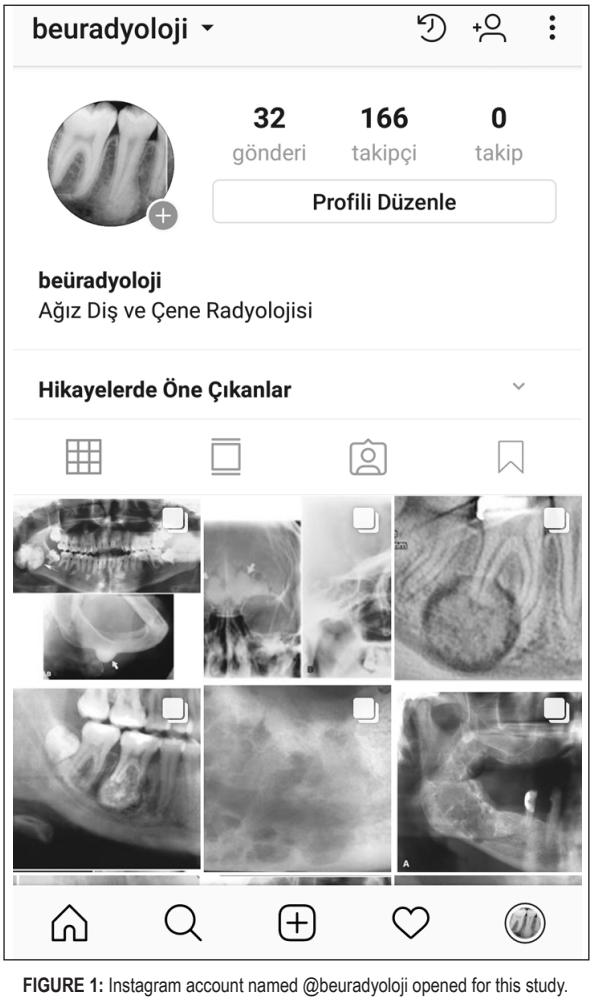

FIGURE 1: Instagram account named @beuradyoloji opened for this study.

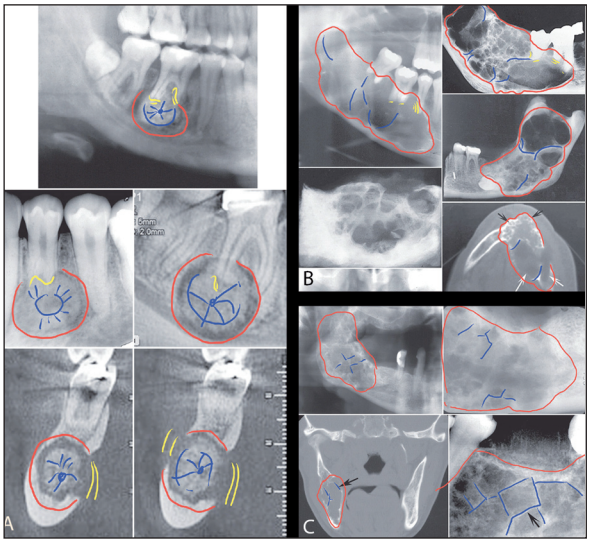

FIGURE 2: A) Internal structure and boundaries are shown in a cementoblastoma. B) Multilocular structure and expansions shown in ameloblastoma. C) The internal structure and flat septa in some places shown in mixoma.

The limits to be considered for each lesion were digitally drawn on radiographs, which were made more striking, such as the internal structure of the lesions, localizations, and similar characteristics (such as the odontogenic myxoma has the tennis racket internal structure or simple bone cyst mimicking a comb image). (Figure 2A, Figure 2B, Figure 2C.)

WORKING METHOD

The knowledge test was held 15 days after the end of the courses. In the knowledge test, 20 multiple choice questions about the images of cysts and tumors were asked to all students using a projector and answer sheet. During the knowledge test time, clinical anamnesis of a patient with ameloblastoma, keratocyst, radicular cyst and cementoblastoma and then the radiologic image of these lesions was shown by a projector (Figure 3). The images used in the study were taken from the books of Oral Radiology Principles and Interpretation, Oral and Maxillofacial Pathology and the radiology archives of Zonguldak Bülent Ecevit University Faculty of Dentistry, Oral and Max-

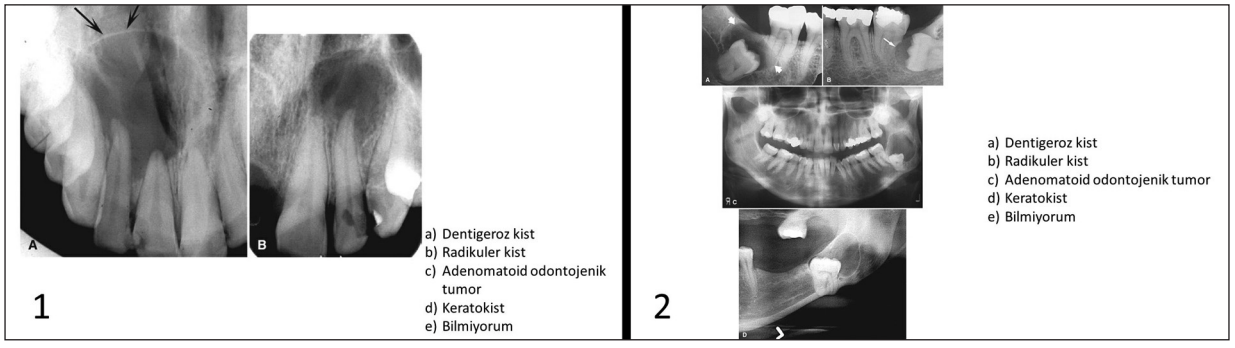

FIGURE 3: First and second questions asked in the first exam.

illofacial Radiology Department.[8,9] These images are the same as the images shared in courses and Instagram, and in addition are new different images. It was announced that these exams would not affect students' passing grades or that they would not have any sanctions.

The students were asked questions one by one and they were given 5 minutes to answer each question. Clinical history and radiology images were kept open in the projector while the students answered the questions. A multiple-choice question consisted of a stem defining the question and a set of 5 possible answers, including a key that was the best answer to the question, and a set of distractors that were appropriate but incorrect answers to the question. Students responded to questions by selecting what they believe best answers. In the questions, the same terminology that was utilized in the course was used. All the problem was expressed in the stem. Trick questions were avoided. While evaluating the exam results, each correct answer was decided to be 5 points over 100 points of the first examination.

STATISTICAL ANALYSIS

SPSS 20.0 software (IBM SPSS Inc., IL, USA) was used for all tests. The study and control group knowledge scores of each group were assessed by the Shapiro-Wilk normality test. According to the results of the normality test, Paired sample t-test was performed to investigate differences between the mean knowledge test scores of the groups. For all p values used in the study $p<0.05$ results were considered significant.

RESULTS

Totally 60 volunteer students of third class, 42 of them were used to Instagram multiple times per day. The average age of the study group (13 female and 8 male) was 19.98 years and control group (11 female and 10 male) was 19.67 years.

The examination average for the study group was 71.97±9.32 with a standard deviation, 68.33±8.39 with a standard deviation for the control group (Table 1). Descriptive statistics revealed that the study group had slightly higher mean knowledge test scores (71.97±9.32) than the control group (68.33±8.39). However, when comparing the examination scores between the groups, the Paired sample t-test showed no significant difference between the study and control groups in knowledge scores ($p>0.05$). Considering the similarity of the examination scores of groups, it shows that the value of mobile-based learning (education with social media) is almost close to classroom education.

TABLE 1: Comparison of knowledge test scores of the groups.

	N	Mean	SD	SD Error	Minimum	Maximum	p value
Study Group	21	71,97	9,32	1,34	45,0	87,5	0.213
Control Group	21	68,33	8,39	1,71	50,0	80,0	

SD: Standard deviation.

DISCUSSION

The present study, which assessed the effect of mobile-based education in teaching radiological features of the cysts and tumors, was carried out among 42 third-year dental students. In this present study, we found no significant difference between the Instagram app group and classroom education group in the knowledge of radiological features of odontogenic and non-odontogenic cysts and odontogenic tumors. The null hypothesis that Instagram-based education is not as effective as traditional classroom education in radiological features of the oral cysts and tumors knowledge was rejected.

In the current study, it was shown that the learning levels were equal between the Instagram group and classroom education groups. Similar with this study, in a study, carried out on intramuscular injection training, it was reported that there were no differences of the immediately and 15 days after knowledge mean scores of the students between mobile-assisted teaching methods by Instagram app group and classroom education group for intramuscular injection education.[7] Higher scores were shown in the web-based group in a study comparing the effect of web-based education and traditional classroom education on the urinary catheterization knowledge and skills of nursing students.[10] Similarly, in a study based on identifying the newborn airway obstruction, it was reported that there were no differences in knowledge scores of the smartphone application group and in-class instruction group, but it was observed that the skill scores of the smartphone application group were higher.[11] But the current study finding is contradictory to the study comparing various education methods on nutrition education, reported that web-based nutrition education group received the lowest evaluation score among the traditional classroom teaching group, web-enhanced, and web-based education groups.[12] This contradiction may be caused by the fact that the current study is based on more visual data such as the striking internal structure of the lesions, pointing localizations of the lesions on the radiographs and Instagram used in this study is a mobile application offering a rich context for visual contents. The visual feature of Instagram may have enhanced the knowledge mean scores of the experimental group. And the Instagram group had slightly higher mean knowledge test scores that could be stem from traditional education methods that caused a memorized working system that does not rely on visuals because of the limited course time, intensive course load, numerous cystic tumors and not remembering all of them. Since the students spend more time with their mobile phone, it may be much easier to repeat the visuals than open them to view the content of the slides provided by the trainer.

When the effects of mobile technology on dental students are examined by Khaaton et al., it is seen that in communication, dental and general education students prefer mobile phone and social media usage most.[7,13] El Bialy et al. studied the use of social media by students and educators in medical education and found that social media programs such as Instagram, Facebook, and Twitter were used for both groups in a serious manner.[14]

With the evolving technology, the strength of our equipment has increased and we have reached the level where we can transfer images in high quality, resolutions to each other and display them on social media. In these high-resolution images, we mark the places we want, put emojis on them, and grab attention to where we want. In this way, we use social media as an advantage, it is antagonistic to be an innovative method of dentistry in a field learning activity where people spend so much time. It was reported that students most used YouTube, Facebook and WhatsApp social media tools for formal and informal learning.[15-20] More popular social media applications should be used in further studies. Twitter was also used in the anatomy education of medical students, and the students overcame this difficult problem by communicating with each other by Twitter app (Hennessy, Kirkpatrick, Smith, and Border).[21] It was reported that Facebook is so useful for developing deep learning methods for students when it is used as a tool to support learning.[22] Similarly to these studies and the current study, Cooke et al. suggested that a web-enhanced classroom environment supplies some opportunities.[23] For example, the student can set the best suitable working hour and time required to understand a topic for them and individual can re-

peat the lessons more easily whenever and wherever they want. In this study, the results of students' learning about cysts and tumors showed that education can be taken not just during class hours and pre-test hours but also between daily activities. In addition to that Instagram's useful, interesting and fun learning method for recognizing cysts and tumors than classroom hours. On the other hand, it was reported that teaching with social media may have some disadvantages. Latif et al. argued that using social media for medical education can cause bad effects on young people's mental health and giving education with social media may cause the time of students to spend on social media. And this can lead to a decrease in concentration over time.

In addition to this work, social media apps can be used for remainder notes after traditional classroom education. We believe that making use of social media in these forms may make it easier and more accessible to learn methods, and this may reduce distractions, accidental and time-consuming features of using mobile-based teaching methods. In this way of learning through mobile-assisted teaching methods and social media applications, it is aimed not only for dental students but also for helping general practitioners, new graduates and specialists to remember new and up-to-date subject learning, reinforce what they learn or remember. In recent years, articles on the use of mobile phones and social media in medical fields and dentistry have begun to increase.[7,24] Now, most of the smartphones in the population have taken these studies to the next level and carried out third-class mobile applications following the desired features such as drug addiction, dental emergency alerts, decay and prevention.[25-27] WhatsApp has been used in the field of oral pathology and oral medicine since it is the most frequently used communication applications in the studies that are made through the applications that we use instead of the new software in this way and it has provided positive results in consultation and clinical application in studies because of its convenience in communication.[28,29]

Several limitations of the current investigation must be acknowledged. First, the study was carried out via the Instagram application. However, studies have shown that the most frequently used social media applications are YouTube and Facebook. Instagram application, in which visual content sharing can be made more striking, was preferred due to the intense visual content of the course. The follower study should be conducted by more popular social media applications. Second, it was announced to students that contents would be given from the Instagram user account and an exam would be held, it may have caused students to use social media more effectively than their routine use. Third, we have been working with a limited number of dental students at our faculty, especially due to the low presence in students in year 3. The application of this learning method to wider period groups or physician communities will strengthen the results of the study.

CONCLUSION

Instagram is an easy and effective application for learning and remembering methods to diagnose cysts and tumors in the oral area for dentistry students. We believe that this new method will help the beginner students and dentists to learn new subjects from miscellaneous areas and keep them in mind pleasantly and independently.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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