**Digital Learning: WhatsApp as a Teaching Aid in Oral Pathology for Undergraduates**

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**Abstract**

**Background:** Influence of social media such as WhatsApp is tremendously increased among students. The query aroused was whether such a familiar platform could be used as a learning tool. **Objectives:** The purpose of the study was to assess the effectiveness of WhatsApp as an educational tool in a complex subject such as oral pathology among undergraduate students. **Methods:** Third-year students of Government Dental College, Alappuzha, were selected as the study population and were divided into Group A and Group B by a simple random sampling. Histopathology slides were discussed conventionally with both Group A and Group B. Furthermore, labeled histopathological images were discussed only for Group A students, in a WhatsApp group named “GDC ALLEPPEY OPATH.” To assess the effectiveness of a new method, a questionnaire was given to both groups and the results were statistically analyzed using Mann–Whitney U-test. An additional opinion poll was carried out with Group A to identify students’ perspective toward the novel learning tool. **Results:** Pair-wise comparison of the mean scores of Group A and Group B showed a statistically significant higher mean score for Group A ($P = 0.005$). There was a significant improvement in the mean score of Group A in their ability to comprehend individual histopathologic features compared to that of Group B ($P = 0.008$). **Conclusion:** WhatsApp can prove to be highly advantageous and enhance learning in undergraduate students when used in supplementation to the conventional learning methods.

**Keywords:** Learning, Medical education, oral pathology, social media, WhatsApp

**Introduction**

New generation of students is acquainted with Internet and thereby learning needs of these “digital natives” have changed a lot.¹ Proficiency of learning environment to adapt to their learning needs is crucial.² Learning methods become even more important while dealing with challenging subjects such as oral pathology.

Students are already using social media such as WhatsApp, Twitter, and Facebook and they spend lots of time on it. Among these, WhatsApp is one of the most widely accepted instant messaging services. Users can create and segregate contacts into groups for specific topic-based discussions. It allows sharing text, audio and video messages, documents, images, and links using mobile phones. It is a great platform for group work because of ability to check who is online and who is not and to check if recipients have received or read messages.³

If social media can be effectively used for unambiguous communication, it could have been modified as a learning tool, especially for undergraduate students. Therefore, a question aroused if the social media such as WhatsApp can alternatively be resourced effectively to teach oral pathology in the changed milieu.

**Aims and objectives**

The present study was conducted to evaluate the efficacy and acceptability of WhatsApp as an educational tool to upskill undergraduate students in the subject of oral pathology. The study also aimed to assess the perspective of students toward WhatsApp as an educational aid.

**Materials and Methods**

Third-year BDS students of Government Dental College, Alappuzha, were selected as the study population. Those students who were willing to participate in the study were
divided into case (Group A) and control (Group B) groups by a simple random sampling. Each group comprised 16 students. Before the commencement of the study, a survey was conducted among students to assess their attitude and understanding of pathology.

Two important topics such as odontogenic cysts and odontogenic tumors were selected for discussions. The concerned histopathology slides available in the department were selected and good-quality images were captured using an iPhone 5s (iOS 11, Foxconn, Apple Inc). A senior faculty in the department approved the quality of each image. WhatsApp group named “GDC ALLEPEY OPATH” was created and students under Group A were added to it. Two faculty members acted as moderators of the WhatsApp group.

Histopathology slides were discussed with students of both Groups in the regular practical classes using light microscopes, signifying the conventional mode of learning. In addition, Group A students were exposed to social media method of learning, i.e., using WhatsApp, where low- and high-magnification images of the slides, labeled, and marked for important features were posted and further discussed. The total duration of the study was 1 month.

At the end of the study, a set of questions were given to both groups and the results were compared to assess the effectiveness of teaching methods. The questionnaire included identification of the lesions and individual histopathologic features. An additional survey was conducted for Group A to identify students’ perspective toward the novel method of teaching. The results were statistically analyzed using Mann–Whitney U-test.

**RESULTS**

According to the survey conducted to assess the attitude toward oral pathology, 86% of students had difficulty to memorize oral pathology in comparison to other clinical subjects. 65% of students expressed difficulty to identify the representative sites/features in histopathology slides. 65% of students stated that they might find the subject more interesting if they could understand the subject better.

Most of students found it difficult to comprehend histopathology of particular disease compared to other aspects. Graph 1 illustrates the ability of students to understand different aspects of the disease.

To assess the level of performance of the study groups, 15 questions related to identification of the lesion and individual histopathologic features were given. The mean score of Group A and Group B students was statistically analyzed. Pair-wise comparison of the mean values showed a statistically significant better result ($P = 0.005$) for Group A. The results are tabulated in Table 1.

| Groups    | Mean   | SD     | $P$   |
|-----------|--------|--------|-------|
| Group A   | 7.1875 | 2.50915| 0.005 |
| Group B   | 4.4375 | 2.68251|       |

SD: Standard deviation

histopathologically. In the identification of individual histopathological features of the lesion, the differences in scores between Group A and Group B were more prominent. There was a significant improvement in the mean score of Group A compared to that of Group B ($P = 0.008$). Graph 2 shows the comparison of performance of Group A and Group B in identifying individual histopathological features.

An additional survey was done for Group A to ascertain students’ perspective toward the novel method of teaching. Five-point Likert scale$^{[4]}$ was used to assess their opinion.

62% of students agreed that inclusion of social media as a method of teaching helped them understand histopathology better. 19% of them completely agreed with usefulness of new teaching method. Most of the participants agreed with continuing new method of teaching in future along with the conventional method. Graph 3 shows the opinion of students about continuation of social media method of teaching.

Most of them appreciated the quality time they were getting with teachers at online platform. The students experienced no additional financial burden with social media method of learning. 69% of students showed neutral attitude, whereas 6% of them disagreed with the opinion that online discussions were more welcoming in asking doubts as compared to the conventional classes. 60% of them completely agreed that they were getting distracted during social media teaching by other online activities.

**DISCUSSION**

Learning happens not only in classrooms but also outside through student–teacher interaction. The Medical Council of India also revised the curriculum which recommends the shift from teacher-centered learning to student-centered
Social media learning tools are not whimsical. Two established learning theories such as connectivism and constructivism support incorporating social media into education system. Connectivism explains how Internet has created opportunities for learning across online peer networks.\[7,8\]

According to constructivism, learning is a social process and students learn best through interactions.\[9\] Using WhatsApp in teaching provides an opportunity to implement both these learning theories in an effective way.\[7\]

A good portion of participants in our study felt that a new method of teaching should be continued in future along with the conventional method. Even the American Medical Association (AMA) guidelines for medical students state that the usage of social media tools promotes medical education.\[10\] Mohanakrishnan et al. noted that WhatsApp intervention helped 98% students to perform well in clinical microbiology.\[11\] Willemse noted a number of benefits in the primary health-care education for undergraduate nurses using WhatsApp Messenger.\[12\]

In a study conducted by Lohitashwa et al., most of the participants felt that WhatsApp allows them to express their opinion without hindrance and make them work like a team.\[13\] Cheston et al. noted that learner engagement was the most prominent plus point in incorporating social media tools.\[14\]

However, according to the present study, 69% of students had a neutral attitude about the role of WhatsApp in expressing their opinion. Learning process of undergraduate students will be different from that of postgraduates or physicians. The present study suggests that even in WhatsApp method of teaching, moderator should make sure that every student is getting enough space in discussions. As social media is becoming an essential part of professional communication, an orientation should be given to students how to use it professionally in budding stage itself.\[11,15\]

Introducing WhatsApp as learning platforms has number of advantages. However, on the downside, this may provide a distraction for the user while at work and may develop an obsession in the user to stay connected all the time. Table 2 enumerates main advantages and disadvantages of social media as a learning tool.

The opinion of participants in the present study is that a new method of teaching should be continued in future along with the conventional method. This is in concordance with Raiman et al.’s study who stated that WhatsApp can be integrated successfully to regular teaching methods.\[16\] Lohitashwa et al. concluded that using WhatsApp as a teaching aid is slightly more advantageous; however, it cannot replace the traditional way of learning.\[13\]

**Conclusion**

On the light of the present study and information gathered from other researches, we put forward few suggestions while introducing novel methods into education. First, educators should make students aware about safe and healthy usage of
social media and should be able to limit discussions toward respective subjects. Proper institutional guidelines for social media behavior may ensure the above-mentioned objectives. Discussions at a leisure pace will encourage even slow learners to follow. Group members should be encouraged and there should be an open mindedness so that everyone can raise their doubts without hesitation.

It will be better if faculties post the matters at almost same time in each day so that students do not have to check every now and then. This may prevent Internet distractions to a certain extent. According to the AMA 2012 Annual Meeting, medical professionals should maintain patient privacy on online platforms.[10] The moderator of the groups should be cautious while handling data on the social platforms. If we are keen to follow essential social media behavioral guidelines, WhatsApp is an excellent supplementary educational tool.

Table 2: Advantages and disadvantages of WhatsApp/social media in general as educational tool

| Advantages                                | Disadvantages                                    |
|-------------------------------------------|--------------------------------------------------|
| Connect with large number of students with no time/ space constraints[13] | Internet addiction and misuse[13]                |
| Familiarity of the use[16]                | Variable learner participation/passivity of some learners[14] |
| End-to-end encryption in WhatsApp providing a secure platform for communication[16] | Distractions from discussion topics[13]          |
| No additional cost[16]                   | Technical issues[14]/poor Internet connection     |
| Encourage self-learning[14,16]            | Privacy/security concerns[14]                    |
|                                          | Students do not want faculty members in their social media contact list or vice versa |
| Better feedback from learners[14]        | Increased workload of faculties[17]               |

Conflicts of interest
There are no conflicts of interest.

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