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RESEARCH ARTICLE

UTILITY OF WHATSAPP®IN TEACHING HEMATOLOGICAL DISORDERS

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ABSTRACT

Background: Innovations are always part of any field. The field of medical education too has experimented with various teaching modalities. The use of social media has been one such platform for disseminating medical education. With the rapid penetration of mobile internet, the increasing popularity of smartphones and the accompanying proliferation of smartphone based applications have opened new avenues to the current age tech savvy medical teacher to experiment with such innovative resources like chat application based medical education.

Methods: This study was conducted to study the utility of the WhatsApp® based group discussion in a group of students of 2nd year MBBS. The ten week online group discussion was conducted on hematological disorders.

Result: Although the number of participants (n=91) in this group activity exceeded the non participants (n=33), the scores obtained by the students in the WhatsApp® group was slightly better for two learning objectives. Also the methodology adopted was noted to be popular with 98% of the participants.

Conclusion: This indicates that this methodology can add flavor to the existing methods and also give an opportunity to interact with his/her teacher in real time. Refinements in the utility of this mode of teaching can be done by further studies in this field and learning from other educators' experiences.

INTRODUCTION

The technological advancements have made proliferation of smartphones in the market. Apart from the routine telephonic conversations, these smartphones have also led to the proliferation of applications, fondly called as "apps". These apps are popular due to the rapid penetration of mobile internet and its appeal among younger generation who are "tech savvy".

The contact time a teacher has with students is limited to only theory classes or practical demonstrations in a given teaching schedule. There is no option of real time interaction or discussion with students most often after working hours. Also students have inhibition to speak to the teacher in front of his/her peer. A chat based application like WhatsApp® was intended to hence be used to overcome this barrier.

WhatsApp® is a communication or chat based application available for most smartphone operating systems. The popularity of this app has been its ease of use, making it popular among the youth in general and students in particular. This app has the provision of forming groups and broadcast lists which have hitherto not been used as a supplement in the field of medical education. Although the use of social media apps like Facebook® and Twitter® in the field of medical education has been common, a literature search in Pubmed on the use of such chat based apps in medical education didn't yield any result till date.

The present study was undertaken to assess the effectiveness of WhatsApp® based teaching of hematological disorders in 2nd year MBBS students with the following specific learning objectives.

At the end of WhatsApp® based group interaction on hematological disorders a 2nd year medical student must be able to

1. Identify morphological abnormalities of formed elements of blood from images of hematological preparations
2. Interpret red blood cell indices, white blood cell & platelet counts
3. Classify the morphological type of anemia
4. Classify the morphological type of leukemia

MATERIALS AND METHODS

Institutional review board approval was obtained. Methodology of teaching was initially explained to the students. Students of 2nd MBBS were enrolled after obtaining their informed consent. These were the students who possessed smart phone with mobile internet and WhatsApp® installed on their phones. WhatsApp® group was formed with the investigator as the sole administrator. The students were also told that there would be no additional incentive as marks for participating in the online discussion.

Study period: 10 weeks (December 2014 - February 2015)
Topics were posted on the WhatsApp® group thus created. Teaching, discussion and moderation was done by investigator on hematological disorders which included qualitative and quantitative disorders of the formed elements of the blood. The topics were discussed using various methods like image based discussion, clinical case based discussion and interpretation of hematological test results. The discussions were carried out after the working hours. WhatsApp® discussion chat logs were saved for further analysis.

The same group of students also attended regular lecture classes and practical demonstrations organized for the entire class on hematological disorders during the same study period.

At the end of the group interaction through WhatsApp®, assessment of all the students was done by using pictorial quiz combined with multiple choice questions. Comparison between the groups which have been taught through WhatsApp® and class lectures and those who have been taught only in class lectures was done.

Feedback was also obtained at the end of the study from the students regarding the WhatsApp® based group discussion, on social media and online medical content through a questionnaire.

RESULT

A total of 124 students from the 2nd year MBBS were included for the study. Of these, 91 students enrolled for the WhatsApp® group discussion and the remaining 33 did not wish to be part of the WhatsApp® discussion.

The Figure 1 shows the performance of the students in the assessment held at the end of the 10 week study.

The first specific learning objective was to identify the morphological abnormalities of the formed elements of the blood. It was observed that the students of the WhatsApp® were marginally better (72.5%) in identifying these abnormalities compared to others (69.69%).

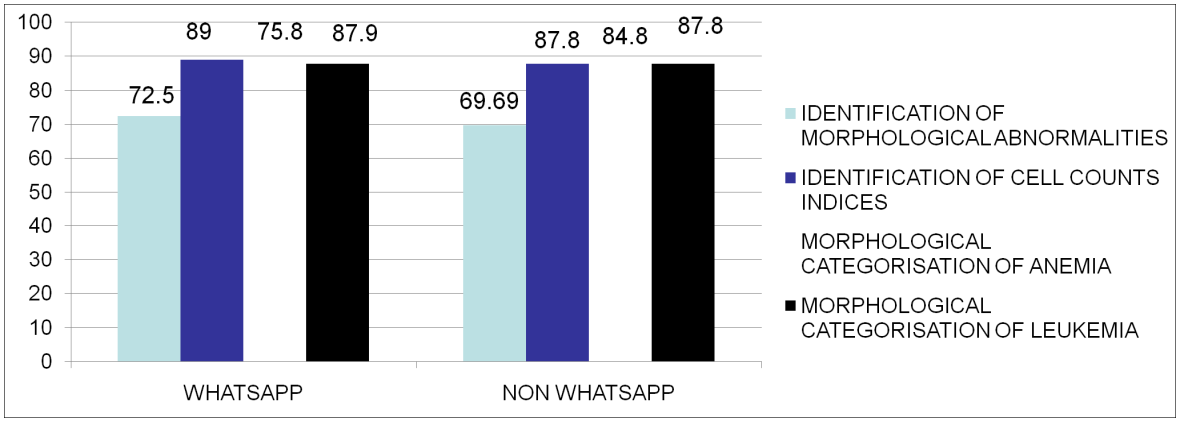

Figure 1 Comparative performance of the students in identifying qualitative and quantitative abnormalities of formed elements of blood (Figures in percentage)

Table 1 Responses obtained from the participants as feedback

Sl no	Question	Percentage of students				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Do you have a Facebook account?	100	0	0	0	0
2	Do you use your Facebook account for accessing medical information through Facebook groups?	15	10	0	0	75
3	Do you share educational resources related to the medical subjects to your friends or colleagues through electronic media like e mail, Facebook, Whatsapp etc?	22	20	0	30	28
4	Do you discuss cases on networking apps (Facebook/Whatsapp)?	15	20	0	35	30
5	Do you believe that all the medical information available online is accurate?	41	20	11	1	27
6	Are you aware of the patient right of confidentiality while posting his/her medical information online?	53	23	10	2	12
7	Are you satisfied with the Whatsapp group discussion on hematological disorders?	95	3	0	1	1
8	Did you find the Whatsapp group discussion to be useful?	89	7	1	1	2
9	Did you face difficulty in accessing the resources posted on the Whatsapp discussion group?	3	1	1	10	85
10	Did you download or save the relevant educational resources posted in the group for further use?	55	20	0	10	15
11	Did you face difficulty in posting answers or media relevant to the discussion topics in the Whatsapp group?	40	15	10	10	25
12	Do you feel shy or scared to interact in such online group discussions?	46	11	20	11	12
13	Do you want to have further discussions on Whatsapp group on other topics?	95	1	2	1	1

To achieve this objective, during the online discussion, exhaustive use of images of all the common morphological abnormalities of the formed elements of the blood were done.

The second learning objective was to interpret the blood cell counts and the indices. The students who participated in the WhatsApp® group were better (89%) in interpreting the blood counts and indices. To achieve this objective during the online discussion, activities like calculation of red blood cell indices, interpretation of hematology analyzer reports of patient samples were undertaken. Students were also encouraged to interpret the hematology reports of various patients during their clinical ward postings.

The third objective dealt with the morphological characterization of anemia. The online discussion was focused on peripheral smear images, hematology analyzer reports of patients and case discussions. However the students who did not participate in the online discussion were able to better (84.8%) characterize the anemias morphologically compared to the ones who had been part of the online discussion.

The study showed that performance of both the group of students was similar in their ability to morphologically characterize the leukemias.

Table 1 depicts the summary of the feedback obtained.

While all of them were users of social media sites like Facebook®, majority of them were not utilizing the medium for medical learning through groups dedicated to medical subjects. Most of the students were not utilizing the electronic media to share educational resources or discuss cases.

Around 61% of students felt that the medical literature content available online was accurate. On the aspect of patient confidentiality, 76% of them were aware that the patients had a right of confidentiality.

The feedback also shows that majority of students were satisfied with the group discussion and most of them wanted further topics to be discussed through this mode.

DISCUSSION

WhatsApp® is a communication app facilitating the exchange of instant messages, pictures, documents, videos and voice calls via an internet connection. Its popularity can be judged by the fact that it has been installed on smartphones over a billion times all round the world. It enables easy communication via text or voice messages between two or more persons. The sending and receipt of messages using the app is cost free. It is available across the globe on multiple smartphone operating systems making it extremely user friendly and popular.[1]

In a study, it was observed that 20% of the smartphone usage was attributed to WhatsApp® with younger participants tending to have longer daily usage. WhatsApp® may not be directly comparable to social network services such as Facebook®, as WhatsApp® is primarily a communication service.[1] The concept of groups on WhatsApp® is similar to web-based forums, e-groups or Facebook™ groups. The disadvantage of web-based forums especially e-mail based ones is that the process of sending, receiving and commenting on cases can be cumbersome and less spontaneous. Uploading, downloading, saving and viewing images is much more convenient with WhatsApp®. An additional advantage is that the sender knows how many people have viewed the case making it easier to decide on whether to post reminders, if necessary.

The advantages of WhatsApp® as medium of instruction are many. It provides a platform for real time interaction. This was put to use in this study by making the students to participate in real time from the comforts of their rooms to discuss various topics. The modalities of the chat based discussion can be held in three ways a. a direct one to one interaction between two persons b. distribution of message or information as a broadcast to multiple members at the same time and c. formation of a group of individuals, with a single or multiple persons as group administrator and interactions within the group. In this study, the third mode of interaction was chosen with the investigator being the group administrator and the students being the members of the group. This app allows sharing of pictures, videos and documents. This is very useful especially in the field of medical education in general and pathology in particular where images form a major mode of teaching tool. In this study, this was put to maximum use by sharing many images from standard resources. Also it was easy to share pictures of hematology analyzer reports, images of formed elements of blood etc., for the purpose of discussion. Most of the participants didn't face any problem in accessing the resources posted in the group during the course of discussion. Among them around 75% of the participants downloaded and saved the resource materials posted by the administrator for later use.

The app also allows mailing the chat logs. This is a useful feature for analysis of the level of participation in such discussions.

WhatsApp® has also served as a medium for consultants to help patients during the times of emergency.[2] Although social media continues to grow in leaps and bounds, some educators find that they do not offer any suitable modes of learning. This could perhaps be due to the "digital divide" where there are persistent differences in technology adoption and use. The current move of social media as a tool for learning empowers the students.[3]

In the study of the utility of Web2.0 technologies for undergraduate and post graduate medical education, it was noted that all the study groups had high familiarity of the technologies. But there was a "digital divide" noted between the medical students and the qualified medical practitioners. While all the groups were interested in using these technologies for education, the necessity of increased training in using this new approach was felt. Concern regarding the quality of resources used and the time and access to these technologies were felt as barriers in the implementation.[4]

A study by Johnston *et al*. analyzed the effectiveness of using WhatsApp® as a communication method among members of an emergency surgery team. One of the key points the study highlighted was that participants felt a "flattening of the hierarchy" in the team.[5] It also has a positive effect on building student teacher relationship.[6]

Social media has its own drawback. Often it has been noted that many videos posted on sites like YouTube® is inaccurate with no regulation of content. Also, overcrowding of such sites with material often leaves the students confused. In the present study, 61% students believed that the medical content on the internet was accurate. Perhaps the educational institutes or universities should be pro active and post their own regulated,

accurate and tailored subject contents. If this isn't feasible, they should at least endorse those contents which are accurate.[7] In the present study, the content posted on the group for discussion was carefully chosen from standard reference books of hematology. While health care providers have been quick to adopt newer smart personal devices, their usage in clinical practice is varied. Social media has become an integral part of the younger generation who are always "online" and "connected". However 80% of these residents have little or no worry at all regarding online privacy.[8]

In a study of final year medical students' experience with and attitudes towards using personal smartphones in the clinical environment, it was observed that 86% of students used them for patient related communication and 68% believed that such communication posed a risk to the privacy and confidentiality of patient health information.[9]In the present study 76% of the students were aware of the patient right of confidentiality.

WhatsApp® as a platform has shown to facilitate communication within the health care team. It also provides the attending physician a constant oversight of activities undertaken by his juniors. It also allows clinical independence with minimal risk to patient safety.[10]

In the study on the new resident perceptions and practices in the context of social media, it was noted that several areas of potential educational opportunity arose. Online privacy, digital professionalism, patient privacy and social media policy were some of the areas identified.[8]

In the present study, although blood reports of real patients were used for the purpose of case based discussion, care was taken not to reveal the patient identity. The advantages of instant messaging like WhatsApp® between a group of students and their teacher include rapid arrangement of ad hoc teaching, the identification of interesting patients, and a platform to discuss cases. Students can ask for additional support during the less busy hours. It also has a positive effect on building student teacher relationship.

In the current study, the discussions were held after the working hours. It had several advantages. The first being, the environment of a classroom was no longer a barrier in the online group. The students could freely express their views and answers by posting answers and participating in the online group discussions. Secondly, the restricted teaching time provided for lectures was not a limiting factor here. There was real time interaction with the participants.

Social media tools can be of help in such connectivist approaches as they can be accessed at convenient times by the learner.[11] However, the availability of a good stable internet connection is a necessary prerequisite. With the current mobile network infrastructure and many campuses offering free internet facility through wi-fi mode, the limitation of internet as a resource should no longer be a worry especially in the Indian context.

Mobile internet has certainly known to distract the attention of everyone.[11] The younger generation is all the more hooked on to the internet through various sites. In fact, many institutions do not encourage the use of mobile phones during the working hours. However, the same distracter can be potentially put to use in the field of medical education as was done in the present study.

The results in this study showed that there was no significant difference noted in the performance of the students between the two groups with respect to the study objectives. There could be several reasons for the same. The element of participation is not uniform in such online social media based discussions. The analysis of the chat logs showed that only few students were actively participating in the discussions. There are no definite standard metrics to measure the degree of activity or level of participation on such platforms. One of the means of assessing the participation is by measuring the number of posts by a student on a given topic and the number of posts read by the student in relation to the topic. In all the chats it was noticed that all the students read all the posts. However the pattern of active participation of students varied depending on the topics discussed every day. Some students are inherently introverts and they fear that their posts or answers on the topics discussed might be wrong. Even on coaxing them to participate actively, many students chose to remain silent during the discussion. In the feedback questionnaire, 57% students indicated that they either felt shy or scared to post their comments on the group. The "read" log on the WhatsApp® only indicates that the message has been read. However we are not sure whether such posts were casually "read" or they were actually "understood". Perhaps development of analytical tools for the usage of such chat based applications will throw much more light on this issue.[12] With smartphones being described as a "learn anywhere" resource, medical students and doctors are using medical-related applications for both educational and clinical purposes.[9] Medical education has grown beyond the boundaries of the classroom, and social media is seen as the bridge between informal and formal learning.[3] Advantages of electronic educational resources, or e-learning, include ease of access and physical transport, searchability, and the potential for interaction among trainees as well as between trainees and educators.[13] Stanford medical school noticed an increase in class attendance from 30 % to 80 % when on line sessions were introduced reserving classroom time for interactive sessions.[14]

Gray *et al.* conducted a survey in 2008 of Facebook®'s use among Australian medical students and suggested that Facebook® could be of potential for educational purposes.[15] When Facebook® was used as a learning environment for teaching medical emergencies in dental practice, two third of the students agreed that it was useful in education. This course was rated as good by 52.2% of students. An interest in interactive learning was indicated by 32.1% of students. Course attendance in the current study was made optional and had no effect on the student's marks.[16] Peer mentoring noted in Facebook® groups help medical students who seek advice from their peers on study related issues.[17]

Cheston *et al* in their report noted that social media based teaching content favorably impacted the learners in both satisfaction as well as knowledge.[18] The current study too saw high levels of student satisfaction with majority of them seeking further discussions through this mode on other topics. An elective course was designed to teach students how to use the Internet, with a special emphasis on social media. Over a 3-year period, 932 students completed the course. They found the information provided by the curriculum useful for their studies and future practices.[19] Asynchronistic approaches to learning have been applied to ensure comprehensive education.

Applications like Twitter® have been successfully used as a medical education adjunct.[20]

Health professions educators must incorporate multiple social media strategies when developing such platforms like online group discussions or virtual journal club. The facilitators themselves must be familiar with the multiple social media platforms. Web analytic tools should be put to best use to measure the success and impact of such activities.[12]

An online journal club is a novel forum of discussion between authors, content experts and the education community at large. An analysis of the resident teacher role suggested that resident feedback to medical students is important.[21]

In the research to determine the medical students' extent of usage of social networking sites (SNSs) for educational purposes, majority (75%) admitted using these sites, with 20% using these sites for sharing academic and educational information. No single study explored the impact of these sites on the academic performance. Understanding and knowledge of the significant use of SNSs by the medical students demand inclusion of such domains in medical curricula. This will train tomorrow's doctors in fostering their skills of digital technology for educational purposes.[22]

The upcoming studies might formulate the hypothesis "Do social networking sites promote medical education," and might test this hypothesis through regression and correlation analysis.[22]

CONCLUSION

The WhatsApp® based group discussion proved to be a simple and effective supplement to conventional mode of teaching. Although it cannot totally replace the conventional method of teaching, it forms an interesting and effective method of visual image and case based teaching. Social media has the potential in the future to substantially impact and disrupt the conventional modes of medical education.

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