### **Original Research Article**

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# The effectiveness of M-learning over traditional method among the medical students

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#### **ABSTRACT**

**Background:** We are living in an era of technology where smart phones and hence social media have entered into many aspects of our life. Social media tools are gaining attention in medical education as well. Therefore, this study was done to find out the effect of M-learning via WhatsApp over the traditional method and also to know the students' perception towards M-learning via WhatsApp.

**Methods:** The study included 60 sixth semester students and they were divided into two groups of 30 each. 4 sessions were conducted on nutrition and occupational health. For the first 2 sessions, group I was intervention group (TL method was WhatsApp) and group II was control group (TL method was lecture). For the next 2 sessions, group II was interventional group (TL method was WhatsApp) and group I was control group (TL method was lecture). To assess the effectiveness of WhatsApp intervention, a test was conducted using 60 MCQs. To evaluate the participant's perception towards M-learning via WhatsApp, a feedback questionnaire was used. Data was analyzed using SPSS 20. **Results:** There was a statistically significant difference between the 2 groups of students. Interventional-group

**Conclusions:** In our study we found a significant difference between gains of knowledge from WhatsApp compared to didactic lectures. Students were favourably inclined to use the WhatsApp and welcome its role in enhancing their learning experience.

Keywords: WhatsApp, M-learning, Medical students, Medical education, Student perception

perceived WhatsApp sessions to be effective than traditional lecture.

#### INTRODUCTION

Learning helps in acquiring knowledge or skill. Traditional learning in the form of didactic lecture is based on physical interaction between learner and teacher. The traditional didactic lecture creates an instructor-centered classroom setting in which students are more passive listeners than active learners. It remains and is likely to persist as an important teaching-learning method in higher education. Today is the era of information technology. E-learning, which is defined as the use of internet technologies to deliver a wide array of

solutions that enhance knowledge and performance. It has become an important component of today's teaching-learning process in higher education institutes. <sup>3,4</sup>

Indian Universities are taking on this newer methodology, mostly in a blended format. M-learning follows the same principles of E-learning. It is done using smaller electronic tools like smartphones, tablets etc. The attributes of M-learning are spontaneous, personal, informal, contextual, portable, ubiquitous, ambient, unobtrusive or pervasive. As lifelong learning is required in the medical students M-learning offers a great platform

to help them for a better learning experiences with their smartphones.<sup>6</sup>

A mobile facilitates knowledge-centered learning by providing efficient and inventive methods which help students to learn with better understanding. Thus it deepens their understanding of a specific topic rather than merely memorizing large amounts of information and then use this knowledge as a basis for new learning through integration and interconnection. Mobile devices make possible assessment-centered learning as well by enabling the provision of continual feedback throughout the learning process, presenting learners with diagnosis and formative guidance as to what might be improved or what might be learned next. Moreover, in providing prompt feedback, M-learning maintains the appeal of learning and provides a motivating factor that can at times be lacking in traditional modes of education.<sup>7</sup>

WhatsApp messenger has potentially been dominant in terms of usage amongst students. It is a messenger application that has variety of functions, like text messages, images, audio files, video files, and links to web addresses. A unique feature of this application is the option to create a group. The one who makes the group becomes the admin of that particular group, who can add and remove the group members. All participants in the group have equal rights. WhatsApp can provide an active form of learning. It improves interaction between student and teachers for motivation and learning. 9

WhatsApp can be used in higher education in a number of ways to achieve different educational goals. A recent survey among the students revealed WhatsApp has enhanced the effective flow of sharing the ideas and information. Since it is most utilized among our students, this social media was selected to deliver an engaging lecture. The WhatsApp group are encouraged to participate actively by searching information online or offline. Though M-learning cannot replace the conventional learning but it can definitely be a supplement for a learner to learn anything, anytime and anywhere.

The established popularity of WhatsApp Messenger as a social communication tool which can be successfully integrated into teaching was the reason why it was chosen as the application of choice in this study. The familiarity of the use of the application meant that no training had to be organized. The aim of this study was to find out the effect of M-learning via WhatsApp over the traditional method and to know the students' perception towards M-learning via WhatsApp.

#### **METHODS**

This prospective study was conducted in department of Community Medicine, in DM WIMS, Wayanad, Kerala, from February to March 2019. It was an interventional study which was conducted after obtaining institutional

ethical committee approval. 60 sixth semester undergraduate students were randomly included in the study after getting informed consent. Study participants were divided into 2 groups. Group I and Group II, each comprising 30 students. Total 4 sessions were taken on nutrition and occupational health. First 2 sessions were on nutrition. Group I was the intervention group and for this session T-L activity was done via WhatsApp group. Group II was the control group for this session and T-L activity was via lecture. Next 2 sessions were on occupational health. Group II was the intervention group for this session and T-L activity was done via WhatsApp group. Group I was the control group for this session and T-L activity was via lecture. Students who were not willing to participate were excluded from the study.

During WhatsApp sessions, questions were posted by facilitator pertaining to topic, which were answered by students either as videos, attachments, typed answers, etc. Any doubts by students were cleared by facilitator. Active participation was encouraged. During lecture sessions, questions were asked by the facilitator at the end of session and any doubts on topic were cleared.

At the end of each topic, which comprised of 2 sessions, a MCQ test with 30 questions was conducted. Questions in each test was pertaining to the topic covered and was conducted for both the groups to assess the effect of WhatsApp intervention. To evaluate the participant's perception towards M-learning via WhatsApp, a feedback questionnaire consisting of open ended and closed ended questions on acceptability and usefulness of this method was taken from both the groups. Data was analyzed using SPSS 20. Un-paired t-test for test of significance was done to compare the average scores of 2 groups. To analyze perception towards M-learning via WhatsApp percentage of response was calculated.

#### **RESULTS**

The mean and SD of test (MCQ) score after first topic (nutrition) covered for intervention group (group I) was 17.37±2.03 and for control group (group I) was 13.87±2.66. The mean and SD of test (MCQ) score after second topic (occupational health) covered for intervention group (group II) was 17.63±2.17 and for control group (group I) was 11.7±2.76 (Table 1). There was statistically significant difference between the test score of two groups with a p-value of <0.01 (Table 1).

During TL activity via lecture, total 9 questions were asked by the learners, 18 questions asked by facilitator and learner responses during 4 sessions were 30 (Figure 1). During TL activity via WhatsApp, total 30 questions were asked by the learners, 20 questions asked by facilitator and learner responses during 4 sessions were 130 (Figure 1). Learner responses during WhatsApp sessions included answer to facilitator's questions, answer to other learners' questions, study material in the form of pictures, videos, etc

Table 1: MCQ test score of both intervention and control group.

MCQ	Intervention group (n=30)		Control group (n=30)		Significance
	Mean	SD	Mean	SD	
Nutri tion	17.37	2.03	13.87	2.66	<0.01
ОН*	17.63	2.17	11.70	2.76	< 0.01

\*OH- Occupational health.

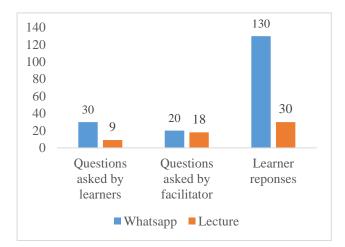


Figure 1: Participation by learners during lecture and Whatsapp sessions.

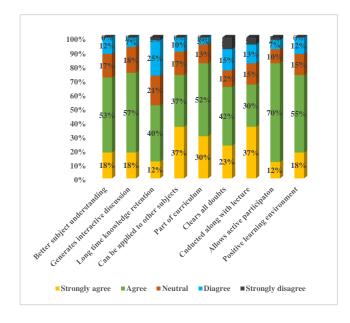


Figure 2: Learners' perception on Whatsapp usage.

Fig 2 shows learners' perception on WhatsApp usage for interactive lectures. 53% agreed WhatsApp helps to understand the subject well and 18% strongly agreed. 57% agreed it generates interactive discussion, 18% strongly agreed to it, whereas, only 2% strongly disagreed. 40% agreed that helps in retaining the knowledge for a longer time and 25% disagreed to it.

37% agreed and 37% strongly agreed that it can be adopted for teaching other subjects too, whereas, 10% disagreed to it. 52% agreed that it should be part of curriculum whereas only 5% disagreed. 37% strongly agreed that it should be taken along with lectures. 42% agreed that this method of teaching clears doubts whereas 15% disagreed to it. There was 82% active participation during the session. 55% agreed it provides a comfortable learning environment.

To the open ended questions about advantages and disadvantages of WhatsApp learning we got some appreciative and interesting comments.

#### Common advantages as mentioned by learners include

- It was simple and interesting to follow.
- We can go through material anytime and later come back and refer it.
- There was healthy interaction and discussion between faculty and students.
- Doubts are cleared immediately.
- Easy grasping.

## Common disadvantages as mentioned by the learners include

- Too much message flooding was there.
- It was time consuming.
- Some students' posts large answers without going through it.

#### **DISCUSSION**

In the journey from rote memory based schools to the vast medical curriculum, medical students face considerable challenges and hurdles. This scenario worsens further when all the content delivery is primarily based on didactic lectures. To address this crisis, Medical Council of India (MCI) has revised the medical curriculum which recommends the shift from teacher centered to student centered learning by using various interactive strategies. 11 Today's students, have innovative thoughts, which allows them to process it differently from their predecessors. Of course, they seem to be the new generation, ever growing up with all digital technology. As a facilitator in this modern era, we need to cope up with the challenge of adopting this technology to correlate with the learning styles of students. At present, both the American and British Medical Associations have recommended guidelines for professional use of social media tools by medical students to promote medical information and education. 12,13

This study explored the use of WhatsApp messenger as a tool to facilitate teaching-learning the medical students. The results of this study demonstrate how instant messaging groups like WhatsApp can be a useful tool for student learning process by generating learning

opportunities and providing a record of discussions, also by promoting media sharing and improving communication.

In the present study, we compared test (MCQ) scores of the intervention group to control group. The mean score of the intervention-group was significantly higher compared to mean score of the Control-group (Table 1). Thus, it is likely that WhatsApp sessions along with lecture would increase the attentiveness and eagerness to learn, which is evident by the test score.

In the present study, more interactions in the forms of questions, answers, sharing of learning material, etc., were present in the TL sessions of WhatsApp as compared to the didactic lectures. Our student's feedback on WhatsApp sessions was encouraging as 71% agreed that it helped understand subject better, of which 53% agreed and 18% strongly agreed. 75% agreed that it generates interactive discussion, of which 57% agreed and 18% strongly agreed. 82% agreed that it should be part of the curriculum, of which 52% agreed and 30% strongly agreed. 67% agreed it should be conducted along with lecture, of which 30% agreed and 37% strongly agreed. Hence, TL via WhatsApp along with lecture would definitely help them to identify gaps in their own knowledge.

Results of our study are supported by previous studies done by many researchers on the role of mobile phone learning in medical education. <sup>14-16</sup> A study was done by Rambe and Bere on using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology. 17 They reported a positive feedback from students on WhatsApp learning. Their students also found it a good tool to increase the motivation towards learning and it can help bridge the gaps in knowledge. Barhoumi in his study observed that WhatsApp facilitate knowledge sharing among peers, improve learners' manipulative skills, facilitate the learning process and foster evaluation process. 18 Salehi et al opined that WhatsApp application as a learning tool enhances student's retention during learning. 19 Dhananjay A in his study noted that WhatsApp as a learning tool foster student's interaction and retention during learning.<sup>20</sup>

There are both advantages and disadvantages of mobile based learning. Our students found WhatsApp sessions easy to follow anytime, anywhere. They were happy for the healthy interaction between faculty and students. They also said doubts were cleared immediately. Some potential challenges in mobile based learning as mentioned by students were too much flooding of messages, time consuming and that some students posted large answers without going through it.

Mobile learning creates a virtual learning environment. It can also be used to give mock assessments like SEQs and MCQs. Moreover, not only the learners interact with

faculty but also get advantage of peer assisted learning (PAL). Our study throws open opportunities for further research in exploring the benefits of WhatsApp mobile learning. Moreover, multi-centred randomized trials should be conducted to prove the beneficiary role of WhatsApp learning in medical education. We also suggest that the university can make certain guidelines for use of mobile application in medical education to cope up with the challenges associated with it.

#### **CONCLUSION**

WhatsApp is an effective social media tool to motivate, augment and perhaps improve the learning of undergraduates in addition to traditional teaching. High infiltration of smartphones has initiated growing use of WhatsApp for groups of teachers and their students to support the learning process by allowing direct access to lots of online resources. Combination of medium like videos, pictures and voice notes along with constant availability of facilitator and learning anytime anywhere, has made WhatsApp a new and convenient tool for teaching learning activity. In our study we found a significant difference between gains of knowledge from WhatsApp compared to didactic lectures. We also found advantages out pars the disadvantages. A few disadvantages, like message flooding and eye strain can be overruled by making small groups and using mobiles with bigger screen. Further studies are needed for its adoption and responsible integration into medical education.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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