

ORIGINAL ARTICLE

iPAD use in Graduate Medical Education: A Pilot study from A Medical College of West Bengal, India

Satabdi Mitra

Assistant Professor, KPC Medial College, Kolkata, West Bengal, India

ABSTRACT

Introduction: National Medical Commission (NMC) has stressed upon online and blended learning and has recommended strongly for digital learning in undergraduate medical education. **Aims & Objectives:** to assess the prevalence of usage and perceptions towards technology among medical faculty members in study setting. **Methods:** an Institution-based cross-sectional study with self-administered questionnaire was conducted for 3 months among forty-six teaching faculty over pre and para clinical departments of a medical college of West Bengal, who have received induction training and were using iPAD for teaching-learning. **Results:** among total 46 participants, 16 were from pre-clinical and 30 from different para-clinical departments. Though the duration of smartphone usage is more than 2 years by 2/3rd of them, less than ½ were found to be habituated with computer usage. 31 (67.39%) participants were found to use iPAD 3.01±1.00 hours for personal use and 19 (41.30%) use iPAD for 4.49±2.88 hours for educational purpose. More than 60% of participants recommended iPAD introduction in medical education. **Conclusion:** usage of iPAD among medical teachers has been widely accepted chiefly in acquiring wide range of resources, disseminating knowledge and managing time more effectively. Blended learning with compulsory digital learning is expected to broaden horizon of future medical education.

KEYWORDS

Undergraduate Medical Education, technology, faculty Members, i-PAD, smartphone

INTRODUCTION

Medical education is witnessing many newer things in recent years. Electronic learning or e-learning is one of them. To provide multi-sensory inputs, an optimum mix of texts, animations, audio and visuals are inserted in learner-oriented pace. Medical Council of India (MCI) has replaced old curriculum by “Competency-based curriculum”(1) and the National Medical Commission (NMC) horizon report 2017 stressed upon online and blended learning and has recommended strongly for digital learning to be introduced in undergraduate medical education with aim to create Indian Medical Graduates (IMG).(2) Technology-assisted teaching-learning can be achieved by usage of devices like as, mobiles, laptops, mobile tablet computers (iPAD) etc.(3, 4, 5)

A trial was conducted from 2013 to 2015 among undergraduate medical students of Imperial

College London. They were allowed with mini iPADS and it was successful to promote more interactions, recordings from ongoing classes, instant updates etc.(6) Subsequent study also supported students’ acceptance of iPAD as an effective tool for tutorials, group activities and so on.(7, 8) iPad has effectiveness as for better learner engagement, more interaction, opening unlimited world of information through access to various search engines besides lateral benefit of development of tech-savviness among the students from very early years of their career.(9, 10)

A number of medical schools, especially in developed countries have introduced Personal Digital Assistants (PDAs), namely iPAD in their curricula.(11) Despite so many evidences of acceptance and effectiveness of iPADS in medical education, there is paucity of research in this field in India. Considering demographic differences, it is not possible to extrapolate

CORRESPONDING AUTHOR: Dr. Satabdi Mitra. 30/1, Horo Mohan Ghosh Lane, Kolkata-700085

E Mail ID: Stbdimtr111@gmail.com

ARTICLE CYCLE: Received: 19/10/2021; Revised: 05/11/2021; Accepted: 11/12/2021; Published:30/12/2021

CITATION: Mitra S. iPAD use in Graduate Medical Education: A Pilot study from A Medical College of West Bengal, India. J Comp Health. 2021;9(2):83-87. Doi: <https://doi.org/10.53553/JCH.v09i02.006>

findings of western developed nations to developing country like ours. It compelled the researchers to conduct their own study in concerned context to find out the prevalence of iPAD usage among medical teachers in their respective teaching-learning in Graduate Medical Education (GME) and to assess their perceptions as they are playing crucial role in implementation of this new technology which is at its verge of getting widespread launch in the Indian medical education in near future.

With this backdrop, the current study was conducted to assess the prevalence of usage and perceptions towards this new technology among medical faculty members in the Institution under study.

MATERIALS & METHODS

Study type and Design: This was an Institution-based descriptive study

Study setting: the study was conducted in a non-government medical college of West Bengal, which since its inception, has enthusiastically introduced iPAD in medical education and research work widely besides its sporadic usage in patient care also. The medical college is running with 21 departments over different pre, para and clinical fraternities. The college is situated at southern part of West Bengal and running since June, 2016 and has intake capacity of 150 MBBS students in each academic year. Here there are the provisions of patient care, medical education and research with introduction of new competency-based medical education curriculum.

Study duration: The study was conducted for three months, January to March, 2021

Study population: The study population was teaching faculty members over different departments. A 2-hour hands-on training was organized from the Institution on these faculty members. It was predominantly given by Information Technology (IT) department of the Institution itself.

Inclusion criteria: faculty members of the departments where iPAD has been given and those who have underwent induction demonstration on its usage.

Sampling design and Sample size: Total numbers of faculty members of the Institution who are currently involved with iPAD aided teaching was found as 46 over pre and para clinical departments. Through purposive sampling they were included in the study and hence, the sample size was 46.

Study tools: data were collected using pre-designed, semi-structured self-administered questionnaire containing background information, usage of smartphone and computer and iPAD use related questions. Before starting the study proper, the questionnaire was pre-tested in a medical college in the same state assumed to contain similar demographics. The content validity of the questionnaire was tested by subject matter experts (SMEs) of the study Institute.

Strategy for data collection: the principle investigator (PI) visited all the departmental faculty members personally after pre-fixing appointment over telephone. All the faculty members were approached during their duty hours neither hampering work nor getting interfered in their personal spaces. They were interviewed in their respective departments in order to make them feel free to communicate. After explaining them the objectives of the study, on getting their consent, questionnaire was distributed among them. They were requested to fill up it in presence of the investigator so that any doubt on any question could be clarified at once as well as chances of non-receipt of response could be minimized. Available records were checked in relation to relevance to the study.

Ethics and Informed consent: the ethical clearance was obtained from Institutional Ethics Committee [RR-HC/C-127/119(55)] and permission was taken from concerned higher authority. Informed consent was taken from all the study participants.

Data management and Analysis: data were entered, compiled and analyzed using SPSS version 22.0 (IBM, New York, USA) and presented appropriately.

RESULTS

Total no. of study participants was forty-six. Mean age was found as 46 ± 3.4 years (Mean \pm SD). 30 (65.22%) were male and 34.78% were female faculty members. Majority, 40 (86.96%) were found as holders of MD as highest educational qualification in the field in which s/he is currently working as teaching faculty of the institution. 3 were found as MSc, 1 in medical physiology, 2 in clinical biochemistry. one faculty member had PhD as highest degree after MD and DNB in pathology. Out of 16 faculty members of pre-clinical departments, 7 were from Anatomy, 5 from Biochemistry and 4 from Physiology department. Among the para-clinical ones, 10 were from Pathology, 7 from

Pharmacology, 6 from Microbiology, 4 from Community Medicine and 3 were from Forensic Medicine and Toxicology department. 9 (19.56%) of the faculty members stay in quarters situated in institutional premises only. Among the total 46 participants, 16 (34.78%), which is more than one-third was from three pre-clinical departments, namely, Anatomy, Biochemistry and Physiology and these are the departments which are most widely using iPad from very beginning of the institutional undergraduate MBBS student intake being it a new medical college. Among the different para-clinical departments, participation is 30 (65.22%). Of these, majority were from department of pharmacology, closely followed by pathology.

This was followed by department of microbiology. Least usage of iPad in teaching was noted by department of community medicine and less than minimal by forensic medicine and toxicology department. In this institution there are faculty members who have spent 30-40 years in cultivating medical education and beside them there are people in early career phases. Considering this, median has been taken while considering years of experience and it is 8.6 years with interquartile range 3.4 years. Majority, 31 (67.39%) opined that they are using smartphone for more than 2 years while only 20 (43.48%) were found to be in regular use of computer for various purposes for more than 2 years. [Table 1]

TABLE 1 DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO BACKGROUND CHARACTERISTICS

Parameters	Findings	
Age	Mean±SD	46±3.4 years
Gender	Male	30 (65.22%)
Residence	Inside campus	9 (19.56%)
Departments	Pre-clinical	16 (34.78%)
	Para-clinical	30 (65.22%)
Teaching experiences	Median±IQR	8.4±3.4 years
Duration of smartphone usage	More than two years	31 (67.39%)
Duration of computer usage	More than two years	20 (43.48%)

Regarding the iPad usage, study participants stated that they spend less than 1 hour to maximum 5-6 hours in using this gadget in twenty-four hours. Among them, 31 (67.39%) were found to use iPad 3.01±1.00 hours for personal use. For educational purpose, 19 (41.30%) use iPad but that was 4.49±2.88 hour. Only 2 (4.35%) of faculty members were found to use iPad for patient care services in any form. More than 50% of faulty members admitted that iPad has reduced their manual works besides making their class presentations easier, more attractive and student involvement have been improved too. Almost 2/3rd of study participants (60.87%) recommended for compulsory application of iPad aided teaching learning in the Institution as well as in other medical college. But they mentioned that continuous internet connectivity is of utmost importance to improve communication for coordination, be it the field of patient care or medical education. In the current graduate medical education regulations emphasis has been given on inclusion of digital learning. So that the study participants, being the frontiers of its implementation were asked whether iPad would play role to attract better

students in medical fraternity and 35 (76.09%) expressed their hopefulness in this regard and told that technology is really found as helpful to deliver better and contemporary teaching.

DISCUSSION

With the advancement of technology, medical education has been modified a lot incorporating electronic devices in teaching-learning worldwide. Besides being portable, wireless, it opens wide horizon of resources with ease. Along with developed countries different developing nations are introducing Personal Digital Assistants (PDAs) such as iPad in their curricula. A similar study was conducted by Nuss MA among thirty-seven medical students who were provided with preloaded and free to download various applications in iPads. This mixed-methods study participants reported effective usage of the device in all stages of patient care and for clinical decision support by providing additional necessary data. They also reported better learning and reflective higher end-of-year productivity.(3) Ellaway R has reported different kind of usage of mobile devices by medical learners, like as, management of personal information, emailing,

texting, for social and entertainment and of course for learning.(12) But whatever is the purpose they admitted usefulness the device. Chatterley T et al. from University of Alberta, Canada found more than 2/3rd of study participants to use PDAs for scholarly need besides personal(13) and focus group discussions extracted that the users were self-taught whereas in the current study orientation and hands-on session on usage was given. Though hierarchically the participants of present study possess a higher position but nature and utility as well as perceived effectiveness are very much similar. A study on college teacher education class by Geist E had similar findings.(14) Patel S et al. also showed iPADS to get warm welcome from learners of undergraduate medical curriculum by providing 'blended' learning opportunity.(11) Riss R et al. conducted a study on usage and impact of iPADS on medical students during paediatric rotation in the University of Missouri-Kansas City (UMKC) medical school in United States. It has found significant positive impact in different arenas of learning and patient care.(15) Popularity of iPad has also been shown by Omori et al. in John A. Burns School.(16) Riss also mentioned better time management on iPad usage(15) as also reported in current study. Moran J et al. in a systematic review on articles published between 2007 and 2018 showed effectiveness of tech-based learning among medical students on acquiring mastery in knowledge and skill.(17) Saffari Z et al. also stressed on more usage of technology in medical education by faculty members.(18) Chandra A et al. also emphasized role of technology assisted learning in modern era despite its inevitable evil effects.(19) Jebraeily M also found extensive (>82%) usage of e-learning using smartphone/tablet/iPAD among medical students of Urmia University.(20) In contrary to these, despite being "Digital Bangladesh" there is paucity of integration of Information and Communication technology (ICT) in medical education Bangladesh. This According to Firdoush J et al. training on internet and software usage may bridge the gap of availability and accessibility of horizon of knowledge from digital world.(21) Finally Dhawan S has stressed upon shifting of classroom learning to online mode in pandemic situation and need of EdTech start-ups at all levels of education considering all strengths, weaknesses, opportunities and

challenges (SWOCs).(22) As in the present study setting the blended learning with usage of iPADS in all possible and feasible areas was introduced, the medical teachers being the torchbearers of this has piloted and learners' active involvement in iPad use is highly anticipated in near future.

Conclusions: usage of iPad among medical faculty members in teaching-learning has been widely accepted chiefly in acquiring wide range of resources, disseminating knowledge and managing time effectively besides helping in real-time clinical decision making. This study is one of the earlier in its variant and the study Institution is also pioneer in introducing iPad in undergraduate medical education in the state itself. Despite this, the study was conducted among very small group of participants which may compromise its generalizability but it can open avenues for other medical Institutions to adopt and widen usage of educational technology both among facilitators as well as the learners.

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