ORIGINAL ARTICLE

Use of Smartphone as an Educational Learning Tool in Undergraduate Medical Students of Services Institute of Medical Sciences Lahore

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ABSTRACT

Background: A smartphone is a complex electronic device in which mobile phone is integrated with computer system. Due to its dual system it can perform wide range of functions in addition to its basic function. Along with its applications (apps) and functions this device has becometrendy learning tool among students especially in medical field.
Aim: To assess the use and benefits of smartphone as an educational learning tool in medical students
Methods: It was observational cross sectional study carried out in Services Institute of Medical Sciences Lahore. Medical Students were interviewed through a questionnaire inquiring about useand benefits of smart phone. Data was analyzed using SPSS version 20.
Results: The mean age of students was 26 years and 71% of students were females.97% of students were using internet in their daily routine life. 95%of students owned smart phones with android phone being the common device. Smart phones were most frequently used for social networking and academic purposes.60% students were having medical applications installed in their phones. 79% of students argued that smartphones improved their understanding of study however 71% were of opinion that smart phone was a diversion for study.
Conclusion: Mostly medical graduates use smartphones for academic reasons and clinical aid. Preinstalled applications and online credible sites were frequently used as learning medium**.**
Keywords: Smartphones, Learning aid, Medical students

INTRODUCTION

While adopting evidence-based practice in treating patients, doctors have to encounter an abundance of information. Due to explosion of medical information and the convolution of treatment options a practitioner has difficulty to acquire all that knowledge and apply it for betterment of the patients. Furthermore, there is complex medical information which is difficult to memorize such as algorithms and clinical guidelines, drug reference, clinical calculations, demographic information. So in order to get tailored medical information, to acquire or refresh medical knowledge or to calculate specific percentages may require time and thus modern digital technology plays important role to provide accurate information quickly[1, 2, 3].

The internet, one of the prime digital technological gadget, offers pool of information with respect to pathology of diseases, treatment options, surgical procedures and pharmaceutical products. This technology provides the tailored medical information instantly and cheap as compared to books and notes. Thus, Internet proffers a great prospective to meet the academic requirements and to promote learning[4]. The utilization of internet would depend upon number of medical students who know how to operate a computer, tablet or smartphone as well as the quality and cost of the services which are provided[5]. These electronic devices are increasingly being used in medical education and proving exceptional educational learning tool for medical students[6].

Smartphone are among the devices with advance technology and becoming trendy for clinical use among medical students and professionals.[7]Basically a smartphone is a cellular phone with an incorporated computer competent of executing a wide range of functions, including running various downloadable applications (apps), which were conventionally not coupled with a cellular phone. With the multitude of abilities, the present smartphones have high-resolution cameras, internet and high speed wireless connectivity, and multimedia capability[8]. Enjoying its potential capabilities as portability, ease of use, instant access to the internet, low cost and public acceptance, smartphone will bring tremendous opportunities to facilitate the communications of students, access to a wide range of resources and tools of learning, provide proportional training program with the needs of learners and also for the possibility of lifelong training of a lot of learners with lower cost and independence of time and place[9].

Several studies have evaluated the use of smartphones to support healthcare and public health interventions, notably in the collection and collation of data for healthcare research , healthcare, education and clinical practice in the community.[10, 11]The focus of this study was to assess the use and benefits of smartphone as an educational learning tool in medical students.

MATERIALS AND METHODS:

This was cross sectional study that was conducted in Services Institute of Medical Sciences Lahore from May 2017 to May 2018. A total of 400 students from clinical years (third year, fourth year and final year) were included in the study. Medical students both males and females of all age groups using modern facilities were included in this

study. Students of preclinical classes (first year and second year) those who were preparing for supplementary were excluded from the study. The data was collected within the duration of 30 days. Collection of data was commenced after the permission of the concerned department and after approval of ethical committee on especially designed performa. The data collected consists of following variables: recording the age and gender of students, owning of smart phone, type of smart phones, utilization of smart phones and use of pre-installed medical apps. In addition, students were inquired about the chief benefits of use of smartphones. Both descriptive and inferential statistical analyses were performed in SPSS version 20.

RESULTS

In total 400 medical students responded to the questionnaire. The mean age of students was 26 years and ranged from 20 to 35 years. There were 29% (116) male and 71% (284) female. Out of 400 students 120 (30%) students were from third year class, 130(32.5%) were from fourth year class and 150(37.5%) were from final year. Out of 400 respondents, 240 (60%) were hostilities and remaining 160(40%)were day scholars. Out of total students, 388(97%) were using internet in their daily routine life. Out of which 51.5(51.2%) of students were using internet for 1 to 2 hours, 100(25.8%) were using for 3 to 4 hrs, 60 (15.5%) were using for 5 to 6 hrs, 28(7.2%) were using for 7 to 8 hrs and 32 (8%) were using for 9 hrs or more. The main reason students browsing internet were as follows; accessing social websites (50% of students), academic purposes (40% of students), entertainment (5%of students) and news updates (5% of students)as shown in Table 1

Table 1: Main reason of students for browsing internet

Variables	n	%age
Social websites	200	50
Academic purposes	160	40
Entertainment	20	5
News updates	20	5

Of the students responded to questionnaire 380(95%) owned smart phones. Out of 380 students who were having a smart phone, 344(90.5%) had android phone, 30(7.9%) had iPhone and6(61.6%) had windows phone. Out of 380 students with smart phones, 320 (84.2%) were using phones for internet browsing, 300(79%) were using for reading e books, 281(74%) for social networking, 340(89.5%) were using it for watching video lectures, 323(85%) were using for sharing lectures, 285(75%) were using it for literature search and 99(26%) were using the smart phone for group study.

Table 2: Students with smartphones using different medical applications

Variables	n	%age
Management and diagnosis apps	266	70
Medication/drug relates apps	247	65
Apps for clinical score/calculators	190	50
Apps for surgical procedures	76	20
Apps for laboratory reference values	38	10

Of all smart phone users, 228(60%) students were having medical applications installed in their phones. Types of medical applications installed were as follows; management and diagnosis apps (70%), medication/drug relates apps (65%), apps for clinical score/calculators (50%), apps for surgical procedures (20%) and apps for laboratory reference values (10%) as depicted in Table 2.

Out of all respondents with smart phone, 220(57.9%) were using these apps several times a day, 76(20%) were using one to two times daily, 38(10%) were using 3 to 5 times weekly, 36(9.5%) were using 1 to 2 times weekly and 10(2.6%) were rarely using medical apps. Medical apps were mostly used at home/hostels (280), followed by library (76) and then lecture theatres (38%).

Out of all students who were using smart phone, 312(82%) were searching study material through credible online resources. Out of all the students interviewed 316(79%) of students believed, that eLearning improved their understanding of study. However, 284(71%) were of opinion that smart phone was a diversion for study.284(71%) of students believed that time availability limited their usage of smart phone while 116(29%) were of the opinion that lack of skill was the limiting factor. Out of total 280(70%) of student argued that smart phones should be allowed in college and lecture theatres.

DISCUSSION

Smartphones have revolutionized the way we access information. This has perhaps been most useful to the scientific community, which includes medical professionals. There is no denying the fact that constant reading is the only way to continue being a quality healthcare professional. For residents, it is the only way to 'start' being one. We all love our medical texts and references. Nevertheless, the most troublesome task is to cope up with the huge bulk of material and data provided in multiple applications. Technology plays important part in this regard. Smartphones with readily available internet and clinical apps provides a targeted time saving approach for a given medical problem.

All the students reported that they were using computer and Internet, irrespective of the frequency of its use. This is a promising sign and well describes the inclination of medical students towards modern gadgets and updating themselves with the technology. This percentage was significantly higher as compared to other studies among medical students[12]

95% of students owned smart phones. Android phone was the most common phone used. They were used frequently for social networking and academic purposes. Robinson T et al., in their study reported that 59% of students owned a smart phone with iPhone being the most common device. They further elaborated that the students mostly used smartphones as learning aid[13]. Another study done by Franco et al (2012) showed that over 85% of respondents used smartphones in which most common operating system was iPhone and the most common usage was as clinical learning aid[14]. A survey conducted by Payne KF et al., in UK demonstrated that 79% of all medical students interviewed owned a smart phone with iPhone being the most common model. In this survey medical

students used their smart phones for academic perposes[15]. In present study higher percentage of students owned smart phone as compared to other studies. As far as type of smart phones were concerned many studies showed iPhone the most frequently used device[13, 14, 15] but some studies illustrated android phones being the most common phones[16]. Android phone was the most common device used by medical students in this study owing to its cheaper price as compared to iPhone as well as android phones are easy to use as compared to iphones. As with other studies, this study also demonstrated that smart phones were commonly used for academic or clinical purposes

In this study, 60% students were having medical applications installed in their phones. The most frequent application installed were management and diagnosis apps followed by medication/drug relates apps. A survey conducted by Payne KF et el., in UK showed that with 72.4% of doctors using medical apps in their clinical practice.[15]In a study conducted by Safdari R et al., described that 53% 0f students were using medical apps. Finally a survey done on dentistry students in Australia showed that 37% of students had installed medical apps in their phones.[17] In this study a handsome amount of medical students were using medical apps for the learning due cheaper prices of phones, free medical apps available online and easily available internet connection and cheaper charges.

CONCLUSION

Most of the medical students owned smartphones. Mostly they used smartphones for academic reasons and clinical aid. Preinstalled applications and online credible sites were frequently used as learning tools. Smart phones is emerging as a new modality for learning and education and it is being used as a medium of learning in medical profession.

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