Study Of Perception Of Students Regarding Feasibility and Use Of Mobile Phones In Medical Education In A Medical College In South Gujarat.

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Abstract:
Background: Mobile technology is one of the most new technological innovations that can be integrated into medical education. M-learning has been used as a complementary resource for interaction between students and instructors for motivation and learning. An ever-growing number of healthcare professionals view mobile devices as a way to increase job efficiency and assist in improving the quality of healthcare delivery. Mobile learning has the potential for interactive instruction as a self-study education resource or during live formal lectures, laboratory sessions, and self- assessments similar to the automated response system.
Objectives: to know the perception of students regarding use of mobile in medical education by identifying pattern of usage of mobile phone. Also getting information of how much use of mobile for various autonomous work and search for ad-hoc information among students. Identifying barriers regarding use of mobile as learning tool among students.
Materials and Methods: A Cross-sectional, questionnaire based study in which Pre-designed, pre-tested and semi structured questionnaire were used. The undergraduate medical students of 1st, 2nd and 3rd year of MBBS were enrolled in the study. After taking their consent, they were provided a self-administrated questionnaire form. One section of contains questionnaires about demographic data of participants, one section about types of smart phone and general purpose use of it. While one section contains questionnaires about use of smartphone for the purpose of medical education.
Result: Out of 410, 402(98.05%) students completed the whole questionnaire. 126 (31.34%) students were from 1st year MBBS, 212 (52.74%) were from 2nd year MBBS, and 64 (15.92%) were from 3rd year MBBS. Total 389 (96.7%) students were using smart phones. 263 (67.61%) were using it by mobile internet, 60 (15.42%) were using it by wi-fi, and 55 (14.14%) were using it by both mobile internet and wi-fi. use of various smartphone tools like use of dictionaries, encyclopedia, video and voice recorder, and online exercises for autonomous work is much more than for educational purpose (p value <0.1). Out of 402 students, 52% (207) strongly agreed that mobile phones can help in their academic excellence and 50 % (203) strongly agreed, when asked if they want mobile in their education.
Conclusion: use of smartphone among medical students is increased. However, its use for entertainment and other activity is still more that mobile learning. Effort should be done, so that the use of smartphone by medical students increase towards the learning.
Keywords: smart phone, mobile learning (m-learning), medical education

I. Introduction

Functions of smartphones have been increasing in scope since the release of the Apple Newton and Palm Pilot smartphones in 1993 and 1996 respectively. Apple's iPhone released in June 2007 blended the features of the PDA with those of the mobile phone. The use of mobile computing devices such as smartphones and tablets is rapidly increasing in the overall population. Current devices are smaller, lighter in weight and have sufficient memory to store large amounts of data and reference material. They also have larger number of applications including those designed for specific medical fields. [1,2]

Mobile technology is one of the most new technological innovations that can be integrated into medical education. M-learning has been used as a complementary resource for interaction between students and instructors for motivation and learning.[3] An increasing number of physicians, residents, and medical students currently use mobile devices such as smartphones, iPads, and tablets for education and use in clinical environments. The move toward more learner-centered education lends itself to using instructional strategies that engage students in identifying and comprehending key concepts, receiving feedback in the course of the student's learning process, and applying concepts to relevant situations. [4]

An ever-growing number of healthcare professionals view mobile devices as a way to increase job efficiency and assist in improving the quality of healthcare delivery. The "Anytime, Anywhere" services

offered by current mobile device technology show promise as an instructional tool that can lead to efficient and improved quality of content delivery. Mobile learning has the potential for interactive instruction as a self-study education resource or during live formal lectures, laboratory sessions, and self-assessments similar to the automated response system. [5]

The objective was to know the perception of students regarding use of mobile in medical education by identifying pattern of usage of mobile phone and gender wise and academic Year wise usage of mobile phone by students. Also getting information of how much use of mobile for various autonomous work and search for ad-hoc information among students. Identifying barriers regarding use of mobile as learning tool among students.

II. Methodology

It was a Cross-sectional, questionnaire based study conducted at the GAMERS Medical College & Hospital, Valsad. The approval of the institutional ethics committee was obtained before starting the study.

A questionnaire was prepared from the similar type of studies done earlier, to assess the perception of students regarding feasibility of use of mobile phones in medical education. They were validated by experts. After validation it was sent to higher authorities for further confirmation. After their confirmation a pilot study was conducted by random distribution of the questionnaire form to 5 participants from each batch of students. The changes in questionnaires was done and reevaluated by experts. Thus a Pre-designed, pre-tested and semi structured questionnaire was prepared.

The undergraduate medical students of 1st, 2nd and 3rd year of MBBS were enrolled in the study. All the participating students in this study were explained clearly about the purpose and nature of the study in the language they can understand. They were enrolled in the study only after obtaining a written informed consent. After taking their consent, they were provided a self-administrated pre-designed questionnaire form and were asked to respond immediately and submit it in response box. The questionnaire will be direct, easy to answer question and did not open many answering possibilities and requiring short answer. The questionnaire contained total 22 questions, divided in three sections. One section of contains questionnaires about demographic data of participants, one section about types of smart phone and general purpose use of it. While one section contains questionnaires about use of smartphone for the purpose of medical education. Among them 3 questions were with binary (Yes/No) answers, 16 were with direct response, 2 with likert-type scale answers were used. One question invited them to write about their comment on the matter. After answering the questionnaire they were collected and sent for analysis. Variables were coded and data entered electronically into Excel spread sheet. Frequency distribution and percentages were produced for categorical variables while statistical comparison was conducted using chi-square test. Level of statistical significance was set at $p < 0.05$.

III. Results

Out of total 450 medical students, 410 students from different semester were approached for the study. Out of that 402 students completed the whole questionnaire and could be included in this study. So, full respondents were 98.05%. Among 402 respondents 233 (57.96%) were female and 169 (42.04%) were male. As seen in table 1, 126 (31.34%) students were from 1st year MBBS, 212 (52.74%) were from 2nd year MBBS, and 64 (15.92%) were from 3rd year MBBS. Out of 402 participants, 374 (93.03%) were residing in hostel within the college campus and 9 (2.24%) were residing outside campus but away from the home. While only 19 (4.73%) were residing at their home.

Total 389 (96.7%) students were using smart phones. Among total 233 females 229 (98.28%) were using while out of 169 males 160 (94.67%) were using smartphones. So, as seen in table 1, out of 402 participants 389 (96.77%) were using smartphones. While 11 (2.73%) were using basic phones that are not android, iphone or blackberry system and 2 (0.50) were using e-reader. Additionally 19 (4.73%) participants were using more than one mobile device and 4 (1.00%) participants were using tablet additionally. Table 2 shows use of various features of mobile phone by participants. It shows that other than calling and SMS use of other features like internet, various applications, camera, music, and reading is more frequent. 295 (75.84%) participants responded that they use smartphone for education purposes.

Use of internet by participants (Table 1) shows that out of 389, only 11 (2.83%) were not using internet in their mobile. While 263 (67.61%) were using it by mobile internet, 60 (15.42%) were using it by wi-fi, and 55 (14.14%) were using it by both mobile internet and wi-fi. Nearly 80 % (310) of participants were using the internet few times a day and 11.57% (45) were using at least once a day. Table 1 number 7 also shows efficiency of participant in using mobile applications. Nearly 87% participants can install the application by themselves. While 9% install it with the help of others. As seen in table 3, use of various smartphone tools like use of dictionaries, encyclopedia, video and voice recorder, and online exercises for autonomous work is much more than for educational purpose (p value <0.1). 63% students found that teachers use smartphone for making of power-point presentation. Other uses of smartphone by teachers found by students are searching the

educational materials (39%), communication with students outside class (36%), material sharing (30%) and others. [Table 4]

Out of 402 students, 52% (207) strongly agreed that mobile phones can help in their academic excellence and 50 % (203) strongly agreed, when asked if they want mobile in their education. [Table 1]

IV. Discussion

With increasing amount of information available in medicine today, use of these portable devices help in quick access to medical information and improves clinical management of patients. [6] These devices, also referred to as personal digital assistants (PDAs), have various applications in medical learning and care of patients. The response rate in present study (98.05%) was quite a good as compare to other study like Shakeel Ahmad Mir (2015) who had only 72.41% response rate. [7] Frequencies of male and female respondents were nearly similar in both studies with slight female preponderance. In present study majority of the respondents from 2nd year MBBS, while other study by ThakreSushamaSubhash et al (2015) [8] students from each three year were nearly similar. It was because of students from other academic years were busy were with their examination during the data collection in present study.

Of the students surveyed 96.7% were using smart phone in present study. which is quite high as compared to the study by Karl Frederick Braekkan Payne (2012) in UK. [9] However, as comparision with that study, where iPhone were commonly utilized, in present study Google based android phone is very much commonly utilized. It might because of iPhone are quite costly, and cannot afford by medical students of developing like India. The internet use by mobile net or wi-fi was quite more in present study as compare to other studies like ThakreSushamaSubhash (), [8], EBIYE, EDONKUMOH VICTOR SIR () [].

However, time spend by the students with smartphones for the purpose of their autonomous work was more than education and academic purpose. Students view m-learning found that they thought it is an important supplementary role and must be included in the routine teaching and learning. In present study student's view was taken about teacher's use and smartphone utility for academic purpose. According to them, teachers mostly uses smart phone for powerpoint making and searching the materials. However, use for academic material sharing and online exercise for students should be increase by the teachers. Several factors influence adoption of mobile learning in medical education.

These include building specialized network for smartphones, provision or subsidizing cost of the device to students, adapting materials specifically for the phones, providing training and technical support to students and staff [11,12]. On the other hand, insufficient security, requirement for change, costs, poorly designed packages, inadequate technology, lack of skills, need for a component of face to face teaching, time intensive nature of e-learning, computer anxiety and lack of institutional support are some of the identified barriers [13,14].

It can be concluded that use of smartphone among medical students is increased. However, its use for entertainment and other activity is still more that mobile learning. Effort should be done, so that the use of smartphone by medical students increase towards the learning.

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Table 1: Demographics, pattern of mobile phone usage and views about m-learning by participants

No.	Parameter	Frequency	Percentages
1.	Gender (N = 402)		
	Male	169	42
	Female	233	58
2.	Academic year (N = 402)		
	1st	126	31.34
	2nd	212	52.74
	3rd	64	15.92
3.	Residence of students (N = 402)		
	Hostel within campus	374	93.03
	Hostel outside campus	9	2.24
	Home	19	4.73
4.	Type of mobile devices		
	Basic	11	2.58
	Smart	389	96.76
	e-reader	2	0.47
	Tablet	4	0.94
	mp3	1	0.23
	$\geq$ 1 mobile device	19	4.46
5.	Internet access on the device (N = 402)		
	No	11	2.83
	Cellular	263	67.61
	Wi-fi	60	15.42
	Both	55	14.14
6.	Frequency of internet use (N = 389)		
	a few times/day	310	79.69
	once a day	45	11.57
	twice a week	6	1.54
	very infrequent	15	3.86
	Never	13	3.34
7.	Use of applications in smart phone (N = 389)		
	Use inbuilt	10	2.57
	Install by self	349	89.72
	Install with help	37	9.51
	Don't use app	4	1.03
	NOT answered	2	0.51
8.	View about smartphone in educational tool (N = 402)		
	No	2	0.50
	probably not	7	1.74
	not sure	34	8.46
	probably yes	152	37.81
	Yes	207	51.49
9.	view about future inclusion of m-learning in medical education (N= 402)		
	No	16	3.98
	probably not	24	5.97
	not sure	33	8.21
	probably yes	126	31.34
	Yes	203	50.50

Table 2: shows use of various features of mobile phone by participants

Variables	Frequency	Percentages
Call	394	98.00
Sms	298	74.13
Camera	370	92.04
mp3 player	345	85.82
voice recorder	212	52.74
video recorder	276	68.66
Internet	380	94.53
Apps	377	93.78
Database	102	26.22
Reading	251	64.52
Multimedia	233	59.90
Games	241	61.95
educational purpose	295	75.84
Other	19	4.73

Table 3: Use of smartphone tools for educational purpose or for autonomous work

Tools	for autonomous work	%	for educational work	%
Dictionaries	304	76	173	43
Encyclopedia	164	41	185	46
Voice recorder	72	18	3	0.7
Camera	280	70	172	43
Online exercise	110	27	139	34

Table 4 (10): student's view for use of mobile for educational purpose by teacher

Teachers' use of smartphone	Frequency	Percentages
communication outside the class	147	36
Searching additional materials	158	39
Material sharing	122	30
Powerpoint presentation	252	63
Multimedia	64	16
Voice recording	10	2
Online exercise	29	7
No use	25	6
other tools	4	1
Total	377	84