Smartphones- Help or Hindrance in Advancing Medical/Dental Education

Savita Bansal[1], Deepthy C. Sahadevan[2], Shakila Mahesh[3], Prachi Saffar Aneja[4], Manish Aneja[5]

[1]Department of Pathology, Manav Rachna Dental College, Faridabad, Haryana, India. [2]Department of Biochemistry, Manav Rachna Dental College, Faridabad, Haryana, India. [3]Department of Microbiology, Manav Rachna Dental College, Faridabad, Haryana, India. [4]Department of Anatomy, SGT Medical College Hospital and Research Institute, Gurugram, Haryana, India. [5]Department of Anaesthesia and Liver Transplant and GI Surgeries, Medanta-The Medicity, Gurugram, Haryana, India.

ABSTRACT

BACKGROUND

Smartphone - a hand-held minicomputer housing in itself innumerable applications (Apps) from as simple as a clock to more complex apps like mobile banking etc. has completely revolutionized the very existence of human beings. There are myriads of apps available to the medical fraternity, which aids in not only practicing medicine but learning it too. The major advantage is the convenience it provides in accessing and organizing the data at a speed which is manually inconceivable. But as every coin has two sides, this tool like any other has disadvantages too. Distraction, dependence and reliability of information are some to name a few. The present survey was undertaken as a preliminary step to discern the stance of medical and dental students towards smartphone and its integration as an aid to promote teaching and learning.

METHODS

A questionnaire based cross sectional study was conducted in SGT University and Manav Rachna Dental College. A total of 750 MBBS and BDS students participated in the study.

RESULTS

The study revealed that smartphones have permeated the medical education system, but their use is still limited to sharing timetables, assignment and staying connected with teachers and fellow students. Portability, ease of accessing data, time management, cost effectiveness and respite from carrying heavy books everywhere have endeared the device to students. But a majority of them (83%) still feel more comfortable in learning texts from conventional textbooks.

CONCLUSIONS

Though the merits of incorporating smartphones in our education system definitely outnumber the demerits, one cannot ignore the challenges facing us today. Addressing the limitations, especially devising a method to keep the smartphones in the campus but out of our lectures is of utmost importance.

KEY WORDS

Smartphones, Attitude, Education, Medical, Dental, Students

BACKGROUND

Smartphone is probably the greatest invention of the 20th century. According to Franko a smartphone is not merely a conventional mobile phone with calling facility, it is more like a computer capable of performing a multitude of tasks.[1] Smartphone - a hand-held minicomputer housing in itself innumerable applications (apps) from as simple as a clock, calculator, dictionary, notepad to more complex apps like mobile banking, online shopping et cetera has revolutionized the existence of human beings completely and irrevocably. This palm sized small miracle have given a new dimension to everything in its vogue. People especially the younger generation feel inadequate, incomplete or rather crippled without their smartphones. Everything makes more sense to the younger generation if presented on the mobiles. Applications are like nutrition they can't do without. Be it ordering a shirt or salmon, pen or pizza smart phones have spread their tentacles in every aspect of our lives. One day, without a mobile and the entire population will go berserk.

It is thus absurd to imagine that our medical education system and its classrooms will be spared by such a power packed device. There are myriads of apps available to the medical fraternity, which aids in not only practicing medicine but learning it too. Some examples out of the exhaustive list of popular medical applications are: MedCalc, Drug Infusion, Flashcards, Medscape, PubMed, Epocrates, Medline Plus, Lab test applications, Medical dictionary, Eponyms etc.[2] The major advantage which makes this gadget unique is the convenience it provides in accessing and organizing the data at a speed which is manually inconceivable. As pointed out by Wallace and his colleagues that the ease of retrieving text anywhere, anytime is of foremost importance.[3] Dr. Fahad also felt that the explosion of information technologies has made the world smaller and brought learners together by obliterating the limitations posed by time and place for both onsite and distant learners.[4]

But as every coin has two sides this tool like any other has disadvantages too. Distraction, dependence and reliability of information are some to name a few. Rohilla concluded that smartphones can become a nuisance too, especially during study hours when regular notifications from active applications have a crippling effect on concentration.[5] Habitual use of social media sites also leads to disturbance and loss of study hours.[5] Even Rung and fellow workers surmised that the pervasiveness of smartphones is more of a disruption.[6]

The implications of embracement of smartphones by our students whether positive or negative are still to be drawn, but we can be sure of one thing – these devices are here to stay and stay for long they will. Thus, we should now endeavour to inculcate and optimize their use for our benefit and for the good of our students. How our students perceive the use of smartphone and what their attitude and preferences are, needs to be studied before we could incorporate this device in our formal education system. The empirical data pointing to the difficulties in smartphone's inclusion in our education system should also be sought and addressed. Strategies should be devised to minimize their ill effects or else it will pose a serious impediment to academic progress of future generations.

The present survey was undertaken as a preliminary step to discern the stance of medical and dental students towards smartphone and its integration as an aid to promote teaching and learning.

METHODS

A Questionnaire based cross sectional study was conducted in SGT Medical College, Hospital and Research Institute and Manav Rachna Dental College from October 2016 – December 2017. A total of 750 MBBS and BDS students of the said colleges participated in the study. Convenience sampling was used. Only the first- and second-year students were included. The enrolment in the study was voluntary and the identities of the participants were kept strictly confidential. A comprehensive overview of the purpose of study was elucidated to the students and verbal consent taken before distributing the questionnaires. The questionnaires were distributed during a compulsory lecture schedule. The completed questionnaires were collected after 30 min. of distribution.

A semi structured questionnaire was developed based on the relevant and desired information and literature available from work of past researchers.[7,8] The questionnaire consisted of three sections (1) Demographics (2) Academic and educational uses of smartphone and (3) Attitude towards uses of smartphone in education. Items included questions based on 3 point (useful, not useful and undecided or don't know) or a 2 point Likert's scale (useful and not useful), dichotomous choice (yes/no), single-best response type and free-response type.[3] Students were at liberty to share any additional opinion on matter related to smartphones in education via an open-ended suggestion text box.[7]

Inclusion Criteria
1. First and Second year MBBS and BDS students.
2. Nationality – Indian.

Exclusion Criteria
1. Phones devoid of camera, internet connectivity or downloadable apps were not considered as smartphones.
2. Furthermore, tablets with no calling facility were excluded to avoid discrepancy in comparison.[5]

The data collected was recorded and then analysed through descriptive statistics using SPSS statistical software. All the results were expressed as percentage of the total study group. Graphical and tabular representations of the data was done using Microsoft Excel 2010 (Microsoft, Redmond, WA). Open ended questions were examined by summative content analysis.[9,10]

RESULTS

A total of 651 completed questionnaire forms were obtained with a response rate of almost 88%. The response rate was better in our study than other similar ones, probably because the questionnaires were distributed to the students

personally, during college hours and filled forms were collected without delay.[9] 100% respondents owned a smartphone resembling the data obtained by Fahad in a similar study.[4] This finding further confirms the notion that the university students are habitual of using smartphones on a regular basis.

Further Inclusion Criteria

Once the completed questionnaires were scrutinized, only those students (Forms) were included-

1. Who possessed a smartphone?
2. With an access to internet facility everywhere.
3. Possessing the basic technological skill to use a smartphone (Downloading and saving an app, taking photographs, attaching files in email, sharing data via email others et cetera)

On the basis of the inclusion and exclusion criteria a total of 500 duly completed questionnaires were considered proper for the study. Out of the 151 questionnaires not considered in the present study 32 forms (Approximately 0.5%) were discarded because they were only partially filled.

The demographic data of the students is depicted in table 1. The total number of MBBS students were 240 out of which 127 (25.4%) were males and 113 (22.6%) were females. The total BDS students were 260 out of which 126 (25.2%) were males and 134 (26.8%) were females. Approximate male to female ratio of the study group was 1:1; also, the number of participants were evenly distributed between MBBS and BDS courses. The gender difference was also not examined. Age group of students ranged from 18-20 years. Only 4 (Approximately 0.8%) students out of the total study group said that they use smartphones only for personal purposes ie non-academic work. Rest all the students affirmed that their smartphones serve both purposes– personal and related to academics.

Respondents	No. of Students	
	Male	Female
*MBBS I year	105	73
MBBS II year	22	40
†BDS I year	26	34
BDS II Year	100	100
Total	**253**	**247**
Table 1. Demographic Data		
MBBS: Bachelor of Medicine; Bachelor of Surgery, †BDS: Bachelor of Dental Surgery		

	Regularly	Sometimes	Never
Do you use smartphone in between the lecture?	18(3.3)	210(42.3)	272(54.4)
Do you use smartphone for clearing your doubts after lecture?	183(36.6)	225(45.0)	92(18.4)
What is your preference? a) Reading text from book b) Reading text from internet on phone	a: 418(83.6) b: 82(16.4)		
Do you have any applications / eBooks related to Medical /Dental education	Yes: 275 (55) No: 225 (45)		
You use your smartphones for? a) Emailing (assignments/notes etc) to faculty/ batchmates	Yes: 404(80.8) No: 96(19.2) Yes: 290(58) No: 210(42)		
b) Read lecture notes c) Surf the web for learning material	Yes: 442(88.2) No: 58(11.8)		
Table 2. Academic and Educational Uses of Smartphone			
Numbers in parenthesis indicate percentages			

Should the lecture taken by the faculty be available online?	Yes: 472 (94.4) No: 28 (5.6)
Will it affect the lecture attendance?	Yes: 200 (40) No: 300 (60)
Impact of smartphone on your learning a) Useful aid b) Not useful/ Distraction c) Won't make any difference	a: 243 (48.6) b: 211 (42.2) c: 46 (9.2)
Do you think smartphones are cheaper alternative to textbooks	Yes: 150 (30) No: 350 (70)
Table 3. Attitude towards Use of Smartphone in Education	
Numbers in parenthesis indicate percentages	

	Areas	No. of Students Assenting to it
1.	Time management	302 (60.4)
2.	Assessment	214 (42.8)
3.	Communication	455 (91)
4.	Data and information gathering (surfing)	449(89.8)
5.	Any other – specify Knowledge enhancement Storage of data Portability / Mobility / Movability	 52 (10.4) 220 (44) 434 (86.8)
Table 4. Areas of Learning in which Smartphones Will Be a Useful Aid		
Numbers in parenthesis indicate percentages		

DISCUSSION

The ubiquitous use of smartphones by each and every student irrespective of their social, cultural and economic background have made it ineludible to include this device in medical pedagogy. Whether we like it or not, we can now not remain untouched by this modern miracle. The inclusion of smart phones in our education system is inevitable. We should then strive to elucidate a positive change with this inclusion.

What this study revealed was the fact that though smartphones have permeated the medical education system their use is still limited to things such as timetables and notifications. Notes, assignment sharing and staying connected with teachers and fellow students is another important benefit. The most governing factor responsible for its habitual use appears to be, the monumental amount of text it can filter to seek even a miniscule of relevant information on a subject within seconds using the World Wide Web. Moreover, all the search results can be organized, sorted and stored on the phone itself. Smartphones thus affords to students' freedom from physically visiting the library, spending hours scanning the indexes of bulky physical volumes and scribbling notes. Clarifying doubts and staying up to date in recent advancement cannot get any easier. Time management is mainly attributed to portability. Portability enables students to utilize their commute, canteen, in between the lectures time etc., in surfing the net for information.

A large number of students (55%-58%) in the study group had e-books and medical application such as dictionary, 3D anatomy, MedCalc on their phones. They also felt that faculty lectures should be accessible to them online which will help them discern the must know facts and keep them in tune with teachers' expectations. Students even admitted that sometimes it is easier to get cheaper soft copies of costly books which they can refer to, on their mobiles. Cost effectiveness and respite from carrying heavy books everywhere around the campus have endeared the device to them.

An important observation made during the study was that students (83%) still feel more comfortable in learning texts from conventional textbooks. Majority preferred to read from hard copies of standard textbooks even if it was a bit costly. It is one thing to clarify doubts and gather lesser known facts or screen large volumes of data to get a miniscule information on a topic and totally another to actually study a topic on smartphone from an exam perspective they opined. We in India still follow a pen and paper exam system and it only make sense to keep in touch with these modalities lest we totally loose ourselves in technology they voiced. Another reason for not constantly using smartphones for reading purposes is the small screen size[5]. Eye strain and frequent headaches were mentioned by some.

As mentioned earlier, though each and every student owned a smartphone the usage of the same for academic purposes was limited to dictionary and a few medical app like 3D anatomy, dose calculator etc. In a similar finding Shah and his colleagues also concluded that we are not tapping the full potential of this devise simply because our students are lacking in guidance.[7] Seminars, workshops and awareness campaigns organized in the medical school will go a long way in driving the students towards smartphone learning.

Though the merits definitely outnumber the demerits, but one cannot deny the fact that there are certain pitfalls too. One very important challenge the modern medical schools are facing is devising a method to keep the smartphones in the campus but out of our lectures. Notifications and inattentiveness of some can lead to total disruption of a healthy learning interactive environment of our classrooms. Also, a lecturer sometimes feels threatened and moreover irked by the irrational and irrelevant questioning by students. Smartphones should be an aid to further students' knowledge not a prank they can play on their teachers.

CONCLUSIONS

There are many features and points in favour of use of smartphones in our education system such as the freedom to access and gather information anytime, anywhere even when on the go, time management, communication and keeping abreast with the latest developments in the field occurring in any part of the globe. Rationalizing its use and creating a plan to bridge the perception gap between teachers and students towards the use of smartphones in education system is crucial.

Limitations

This study was conducted on students of private medical & dental institute of India. A similar study involving students from public institutes is highly recommended[9]. Since education is a two-way interactive process one cannot completely justify any change in pedagogy without taking into account the attitude of teachers towards the same. Similar studies should be undertaken to perceive the viewpoint of our teachers too.

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