PATTERNS OF INTERNET USE AND THEIR IMPLICATIONS IN INDIAN MEDICAL STUDENTS: A STUDY FROM A SOUTH INDIAN MEDICAL COLLEGE

Ravi Kishore Polepalli[1], Keshavamurthy Hassan Ramesh[2]

[1]Associate Professor, Department of Biochemistry, MVJ Medical College & Research Hospital, Hoskote, Bangalore.
[2]Assistant Professor, Department of Biochemistry, Pariyaram Medical College, Kannur.

ABSTRACT

BACKGROUND
Internet has become a platform for recent advances, innovative learning methods and self-assessment. Medical students spend significant time using Internet for academic and non-academic purposes. There is a dearth of clear evidence regarding patterns of internet use among Indian Medical students. An internet usage patterns study in First Year Medical students would help identify the necessity to train students in Internet access in the initial phase of Medical course.

AIM
To assess the Internet usage patterns in First Year Indian Medical Students.

MATERIALS AND METHODS
A cross-sectional study in which 132 students studying in First Year undergraduate medical course at MVJ Medical College and Research Hospital, Bangalore, a cosmopolitan city in South India, participated. Data related to internet use was captured using a pretested questionnaire. Statistical analysis was performed using Microsoft Excel version 2007.

RESULTS
70% of students used internet for academic and non-academic purposes. Slow internet speed (31%) and lack of time (23%) were most common amongst impediments to internet use. Majority of students (57%) used internet for greater than 7 hours per week. Understanding a topic better (62%) seems to be most important motive for academic use of internet. 36% of students did not use any academic website.

CONCLUSIONS
First Year Indian Medical students spent significant amounts of time using internet for multiple purposes. There is a lack of awareness regarding academic websites and online animations among significant portion of students. Students in our study may be guided appropriately by Internet training sessions at the beginning of the Medical course to enable the best use of internet for academic purpose.

KEYWORDS
Internet use, Medical Students, MBBS, Academic and Non-academic.

INTRODUCTION: Internet has become a database of latest research outcomes, a source for interactive learning methods and self-assessment tool in Medical knowledge. Medical students access internet for academic and non-academic purposes.[1,2,3,4] Few studies that have been done in India on Internet use by Medical students have two fold limitations- first being, some of them are 8-10 years old;[1,5,6] considering the exponential pace of growth of internet use and online resources, new studies on internet use in medical students need to be conducted to know the current scenario.

Second being, in other studies that were conducted which were relatively recent, there is lack of clear evidence about the academic internet use like teaching aids accessed, duration of use and knowledge sources accessed.[2,7] Hence, new studies need to be conducted to evaluate internet use to assess parameters like purpose of internet use, devices used, teaching aids accessed, sources of knowledge and perceptions regarding internet use. These studies help in developing knowledge base that address the question – Do medical students need to be trained in internet use in order to use internet productively (for academic purpose)? Hence, we conducted this preliminary study to evaluate the use of Internet amongst First Year Indian Medical students to ascertain details like gadgets used, teaching aids accessed, academic purpose, sources of knowledge accessed and perceptions. We conducted this study in First Year students because, any internet training, if needed would be most beneficial if it is imparted in the initial phase of Medical course.

MATERIALS AND METHODS: A cross-sectional design was employed in this study wherein we assessed Internet usage patterns in First Year Indian Medical Students. This study was conducted at Biochemistry Department, MVJ Medical College and Research Hospital, Bangalore. Ethical approval for the study was obtained from Institutional Ethical Review Board. 132 students of First Year medical undergraduate course (MBBS) studying at MVJ Medical College and Research Hospital, Bangalore participated in the study. Informed consent was obtained from the participants. Pretested anonymous Questionnaire consisting of multiple choice and open ended questions was used to record the data.

Questionnaire consisted of items on demographic details of participants, duration of internet use, place and gadgets used, purpose of use, knowledge sources accessed and preferences. Statistical analysis was performed using Microsoft Excel 2007.

RESULTS: Out of 132 students in age group 17-21 years, males constituted 46.2% (n=61). Number of participants that responded to questionnaire items was 132 unless mentioned otherwise. Details of Internet use are mentioned in Tables 1 and 2. In addition, more than 84% of students were able to use Microsoft office software like Word and PowerPoint. Most common factors that impaired the use of internet were slow internet speed (31%), lack of time (24.5%) and high cost of internet (18.2%). 85.4% of students preferred hard copies of textbooks for regular reading over electronic versions. With respect to total internet use (academic and non-academic), 57% of students used internet for more than 7 hours per week, 29% for 4-7 hours per week and 8.4% for less than 3 hours per week (n=131). As far as the academic use of internet was concerned, majority (62.6%) used internet for less than 3 hours per week, 32.5% used it for 4-7 hours and 2.4% used it for more than 7 hours per week (n=126). 58% of students were of the perception that Internet had a distracting effect on studies. 75% of students preferred lecture videos in addition to regular classroom lectures. 68% reported using educational applications (mobile phone applications).

DISCUSSION:
Duration since Internet use: Mean duration since internet use was 6.3 years indicating early initiation into internet use during secondary school for majority of students. Early induction into computers and internet use could also be one of the reasons for high percentage (84%) of students' acquaintance with Microsoft Office software like Power Point and Word.

Place of Use: Overwhelmingly high proportion of students preferred home and/or hostel (90%) as place of internet access. One possible reason being ubiquitous use of mobile phones for internet access that allows the use of internet at the convenience and privacy of home/hostel. A miniscule proportion availed internet facility (10%) in the college library. Previous study by Sharma et al reported a college internet use of 5%.[6] This brings into question the huge

costs towards building internet facility centres at Medical College Libraries.

Impediments to Internet use: Though all the students had access to internet, there were some hindrances to use of internet. Most common reasons that impaired internet access were slow internet speed (31%), lack of time (23%) and high cost of internet (18%). Our findings are quantitatively different from study by Maroof et al who found lack of time (55%), inaccessibility (27%) and slow internet speed (11%) amongst the most common impediments.[2] Factors like slow internet speed and high cost of internet data may be related to preferential use of mobile phones over college library internet centres, where internet access is available to students free of cost and internet speeds are better because of cable based broadband or leased line systems.

Purpose of Internet use: About 70% of students used internet for multiple purposes including academic, entertainment, general information, news, email/chat indicating multidimensional internet use. Similar frequency although slightly less (61%) was reported by Jadoon et al.[8] 70% of students used Internet for academic purpose. Academic use of internet in previous studies showed wide variability ranging from 14% to 81%.[5,8,9,10]

The most common use of internet for academic purpose was to better understand the curricular knowledge (62%) as reflected in the extensive use of online lecture videos (54%) and animations (51%). Though animations were popular, substantial portion of students (49%) did not use any animations online, probably due to lack of awareness. This is important as animations have been shown to improve learning of "difficult to visualise" concepts representing molecular events at cellular level.[11] Maroof et al reported a frequency of 40% for online lecture videos.[2] Smaller proportion of students (29%) in our study used internet to gain awareness about latest research findings. Corresponding frequency in previous studies was 8 to 58%.[6,7] The reason for this could be lack of time in First Year Medical Course to access latest research findings and priority based exam preparation which excludes research findings from core exam preparatory material.

Duration of Internet use: 57% of students used internet for more than 7 hours per week, 29% for 4-7 hours per week and 8.4% for less than 3 hours per week. Corresponding figures reported in a study by Unnikrishnan et al were 18.5%, 33% and 49%. While majority in our study used internet for more than 7 hours per week, corresponding figure reported by Unnikrishnan et al was less than 3 hours. Internet usage by majority of students in our study was at least 200% higher as compared to study by Unnikrishnan et al.[1] A plausible explanation for this could be - study by Unnikrishnan et al was conducted in year 2008 while our study was conducted in 2015. Technological innovations leading to new online applications/resources and deeper internet penetration over time resulting in increased awareness of internet resources may have contributed to

such findings. Based on this finding, we can speculate that internet use by Medical students may further increase in future.

Social networking and Chatting/messaging independently contributed to around half of daily internet use. Majority (82%) of the students used internet more than once a day. The above two findings indicate the need to investigate distraction if any for academic work caused by frequency and type of internet use, especially when studying and non-academic internet use are done together.

Websites accessed: Amongst general websites, Google (93%) followed by You Tube (59%) were the most commonly accessed websites for academic purpose; possible reason being their familiarity with students long before their entry into medical course. Use of Google ranged from 14 - 66% in previous studies. However, it was not clear if the use was limited to academic or overall use.[1,6] With respect to academic websites, Medline/PubMed were the most popular (32%). PubMed was the most common (4%) academic website used in the study by Unnikrishnan et al.[1] Pubmed was the most common (4%) academic website used in the study by Unnikrishnan et al.[1] 36% of students in our study did not use any academic website. Lack of awareness of academic websites could be a reason for non-usage of academic websites by substantial proportion of students in our study. Popularity of Google and YouTube, even for academic use was higher when compared to academic websites. This is a cause of concern as information on such sites may suffer from lack of credibility. Both these findings indicate a need for orientation programs for internet use.

Lecture videos and Mobile phone applications: Majority of students (75%) preferred lecture videos in addition to regular classroom lectures. This hints at a need for creating lecture videos by the faculty that facilitate independent review and self-paced learning which complement traditional classroom lectures, since the respective faculty are aware of unique preferences of their students. 68% of students used education related mobile software applications which again hints at the possibility of creating and using applications for complementing classroom teaching.

Preference for hard copies of textbooks: Though familiar with internet use, 85% of the students preferred hardcopies of textbooks over their electronic versions and 60% of them did not prefer internet based computer tests indicating that choices are not straight forward. Similar findings were reported by Sharma et al wherein 75% of students preferred hard copies of textbooks as their source of academic information.[6] These facts should be considered while introducing any new learning/assessment module that rely heavily on use of computer and/or internet based on the blind assumption that internet is ubiquitously used by students and any online educational module would be readily acceptable to them.

Internet sources as a complement to regular textbooks: In addition to using internet for understanding knowledge, significant portion (45%) of students used internet for gathering more information on a topic indicating internet acts a source of additional knowledge for the students.

Students' perception: Majority (58%) of the students perceived that Internet distracts from academic work. This finding was in contrast to findings reported by Challa et al wherein nearly entire study group (97%) of students felt internet use helps academic performance.[7] 36% (n = 47) of students in our study did not use any academic website. Paradoxically, 70% (n = 33) of these students who did not use any academic website felt that no internet training was necessary indicating lack of awareness of potential inappropriate academic use of internet.

LIMITATIONS OF THE STUDY: This was a cross-sectional study involving a small population of First Year Medical students in a South Indian medical college. Data was self-reported and may have been influenced by "memory recall" and "social desirability" biases. Use of anonymous questionnaires in this study may have minimised "social desirability" bias.[12] One way of avoiding "memory recall" bias is to track internet use by students in real time, but such a study violates the privacy of students and would be unethical. So a study which objectively records internet use by tracking in real time may never be possible.

Based on the preliminary findings of our study, it appears that students in our study would be benefited by Internet orientation session at the beginning of Medical course in First Year that will facilitate best use of internet. Our findings also point to the need for conducting countrywide multicentric observational studies across different Medical Institutions using a validated questionnaire to ensure standardised collection of data. Such studies would help in assessment of country-wise Internet usage patterns and to ascertain the need for creation of well-structured Internet access skills training module that can be integrated into curriculum during the First Year of Medical course.

CONCLUSIONS: First Year Indian Medical students use internet for academic and non-academic purposes. Significant duration of time is spent accessing information primarily using mobile phone at home and / or hostel. Understanding medical knowledge seems to be the primary motive behind academic internet use. However, there was a lack of awareness of academic websites and online animations. There were multiple impediments to use of internet. Creation of Internet training module which addresses the concerns raised in this article may help students in our study in the academic use of Internet. This should be complemented by providing better infrastructural facilities like campus-wide Wi-Fi Hotspots to facilitate unhindered mobile phone use of internet.

Sl. no	Internet use	Numbers (n)	Percentage (%)
1	Number of students (Males/Females)	132(61/71)	
2	Age	18.4(1.02)* years	
3	Years since Internet use (n=131)	6.3(3.1)* years	
4	Places where internet is used		
a	Hostel	81	61.4
b	Home	83	62.9
c	Internet centre at the Library	7	5.3
d	Cybercafé (Internet cafe)	8	6.1
5	Devices used to access internet (n=131)		
a	Smartphone/Mobile phone	117	89.3
b	Laptop/Desktop computer	69	52.7
c	Tablet (Tab)	25	19.1
6	Purpose for which internet is used		
a	Academic or study purpose	26	19.7
b	Entertainment	24	18.2
c	General Information	14	10.6
d	News	9	6.8
e	Email/Chat (Communication)	29	21.9
f	All the above	95	71.9
7	Study resources accessed on internet (n=127)		
a	Case studies	27	21.3
b	Lecture Videos	69	54.3
c	Animations	65	51.2
d	Mnemonics	18	14.2
e	Lecture notes	24	18.9
f	Latest research findings/recent advances	37	29.1
9	Time spent on Internet per day (n=130)	1.7 (1.19)* hrs.	
10	Time spent on Social network per day (like Facebook, etc.) (n=124)	0.8 (0.77)* hrs.	
11	Time spent on chatting/messaging or use of apps like Whatsapp/Snapchat, etc per day (n=130)	0.9 (0.81)* hrs.	
	Table 1: Patterns of Internet use in First Year Indian Medical Students		

* Indicates Mean (standard deviation);
Number of participants (n) = 132 unless mentioned otherwise.

Sl. No.	Internet use	Numbers (n)	Percentage (%)
12	Frequency of internet use		
a	Multiple times a day	82	62.1
b	Once a day	33	25.0
c	1-3 times per week	8	6.1
d	3-6 times per week	4	3.0
e	Once in two weeks	1	0.8
f	Less than once in two weeks	4	3.0
13	Following websites used for study purpose (n=131)		
a	Google	123	93.8
b	Yahoo	3	2.3
c	YouTube	78	59.5
d	Others	2	1.5

14	Academic websites used for study purpose		
a	PUBMED/MEDLINE	42	32.0
b	Cochrane reviews	2	1.5
c	Highwire press	2	1.5
d	Others	39	29.8
e	None	47	35.9
15	Preference for Internet training classes (n=131)		
a	Yes	40	30.5
b	No	91	69.5
16	Preference for Internet based Computer tests		
a	Yes	54	40.9
b	No	80	60.6
17	Reason for using Internet for Study purpose		
a	To get more information on a topic	60	45.5
b	To get doubts clarified	62	46.9
c	To understand topics easily	82	62.1
d	To verify facts given in textbooks (regular hard copy textbooks that are used on daily basis)	9	6.8
e	None	2	1.5
Table 2: Patterns of Internet use in First Year Indian Medical Students			

Number of participants (n) = 132 unless mentioned otherwise.

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