RESEARCH ARTICLE

PATTERN OF INTERNET USE AMONG MEDICAL STUDENTS: A CROSS SECTIONAL STUDY

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ARTICLE INFO	ABSTRACT

Introduction: The development and evolution of internet has brought profound changes in the health care delivery systems. Internet is a cost effective medium of communication which can help in meeting the complex information needs of healthcare professionals. It can serve as an important learning tool in medical education by providing access to latest evidence anytime and anywhere.
Objectives: This study was conducted to determine the patterns of internet access and utilization among medical students undergoing medical education.
Study design: Cross sectional descriptive study.
Methodology Study was carried out in Govt. Medical College, Akola, (Maharashtra, India). The study consisted of 168 medical students (77 interns and 91 final MBBS students). Data was collected through questionnaire.
Result: Out of 168 medical students 75 (44.64%) were male and 93 (55.36%) were female. Most of the medical students (63.77%) were 23 years and above followed by 22years (28.98%) age group. 98.81% (166) study subjects were using internet. More than three forth study subjects 132 (78.57%) using internet daily. 76.79% accesses academic related material. Google was found universal search engine.
Conclusion: It is needful to include short subject/courses in basic computer science and its application in curriculum of medical students to fully utilize online resources to improve their learning and quality of patient care.

INTRODUCTION

The development and evolution of internet has brought profound changes in the health care delivery systems across the globe ranging from education and training to diagnosis and patient management, (Demiris *et al.,* 2008). Internet has fundamentally transformed the patient management practices of health care professionals. According to an estimate, 30% of a physician time will be spent in the use of various information and communication technology tools in 2010, (Skinner *et al.,* 2003). College students are a unique population. Occupying a middle ground between childhood and adulthood, between work and leisure, college students have been at the forefront of social change since the end of World War II. Use of the internet is a part of college students' daily routine, in part because they have grown up with computers. It is integrated into their daily communication habits and has become a technology as ordinary as the telephone or television. College students use the internet nearly as much for social communication as they do for their education. But just as they use the internet to supplement the formal parts of their education, they go online to enhance their social lives, Jones (2002). One of the major goals of medical education is to

encourage students to maintain their knowledge of medical science by becoming lifelong learners. Adequate skills in information seeking and regular use of original scientific sources are key elements in this process. Additionally, it is believed that medical students need training to learn how to use Web-based search tools and techniques in order to find high-quality information resources, (Romanov *et al.,* 2006), Internet is a cost effective medium of communication which can help in meeting the complex information needs of healthcare professionals and has important implications in medical education. It can serve as an important learning tool in medical education by providing access to latest evidence anytime and anywhere. It is especially useful for students from developing countries helping them to keep abreast of ever expanding knowledge bridging the gap resulting from scarcity of resources. Internet has a number of applications in the field of medicine and health. It provides instant access to relevant up to date information at the point of care making it easy for the health care providers to practice evidence based medicine. It offers clinician the ability to manage patients in remote areas while being away from them and makes it possible to interact with colleagues on clinical issue via videoconferencing. It also promotes research and learning by providing access to medical and other online databases, (Majeed *et al.,* 2003; Turner *et al.,* 2003; Dutta-Bergman *et al.,* 2004). The internet is increasingly being used worldwide in imparting medical education and

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improving its delivery. Internet finds many uses in the medical domain including but not limited to rapid seamless delivery of educational material, access to online databases, exploring the application of theoretical ideas and use of various interactive tools to enhance understanding of complex ideas, (Dutta-Bergman *et al.,* 2004; Alghamdi *et al.,* 2009; Virtanen *et al.,* 2002). This study was, therefore, conducted with an aim to determine the patterns of internet access and utilization among medical students undergoing medical education. The study also assessed the self rated ability of students to search online databases, use of health related websites to supplement learning and distribution of problems faced by students in assessing the information at their institution.

MATERIALS AND METHODS

The present cross sectional study was carried out in Govt. Medical College, Akola, (Maharashtra, India). The study population consisted of 168 medical students (77 interns and 91 final MBBS students). Data was collected through questionnaire. Prior to administrating the questionnaire, the class was addressed regarding the purpose of study. After verbal informed consent from the study subjects, data was collected using a pre-tested semi-structured questionnaire. The questionnaire was anonymous to increase participation and reduce the respondent bias. The questionnaire elicited information about demographic profile of students and pattern of internet access and utilization. The questionnaire also assessed various internet related tasks such as downloading medical books from internet, searching internet for classification of diseases and retrieval of full text articles, journals etc.

RESULTS

In the present study 91 students of final MBBS and 77 interns (total n=168) were included. Out of 168 medical students 75 (44.64%) were male and 93 (55.36%) were female.

Most of the medical students (63.77%) were 23 years and above followed by 22 years (28.98%) age group.

Table 1. Baseline information of study subjects (n=168)

Characteristics	Numbers	Percentage
Age group (years)		
a) 21 years	012	07.25
b) 22 years	049	28.98
c) 23 years and above	107	63.77
Gender		
a) Male	075	44.64
b) Female	093	55.36
Year of study		
a) Final MBBS	091	54.16
b) Internship	077	45.84

In the present study out of 168 study subjects, 163 (97.02%) were having internet enabled mobile. 98.67% males were having internet enabled mobile compare to 95.70% females. Out of 168, 98.81% (166) study subjects were using internet. All males (100%) were using internet compare to 97.85% females. More than three forth study subjects 132 (78.57%) using internet daily. 85.33% males and 73.11% females use internet daily. Most of the user (41.07%) spend 1 to 2 hours daily on internet surfing. Study subjects used internet mostly on mobile (94.05) followed by computer/laptop (32.014%) followed by cyber café (08.32%). (Table-2)

Out of 168 respondents, 129 (76.79%) accesses academic related material, 137(81.55%) accessed social sites, and 22 (13.10%) accessed pornographic material on internet. More females were (87.10%) accessed academic sites compared to males (70.67%). 29.33% males reported accessed to pornography whereas no female accessed that. Overall 75% study subjects read or downloaded book. Compare to 83.87% female only 64% males did the same. Google was universal search engine, all study subjects were using this followed by Yahoo (2.98%).

Table 2. Internet access pattern of medical students (n=168)

	Characteristics	Total	Male	Female
1.	Having internet enabled mobile.			
	a) Yes	163 (97.02)	74 (98.67)	89 (95.70)
	b) No	005 (02.98)	01 (01.33)	04 (04.30)
	Total	168 (100)	75 (100)	93 (100)
2.	Use of internet			
	a) Yes	166 (98.81)	75 (100)	91 (97.85)
	b) No	002 (01.19)	00 (00)	02 (02.15)
	Total	168 (100)	75 (100)	93 (100)
3.	Frequency of internet use			
	a) Daily	132 (78.57)	064 (85.33)	068 (73.11)
	b) More than one day in week	019 (11.31)	008 (10.67)	011 (11.83)
	c) Weekly	009 (05.36)	003 (04)	006 (06.45)
	d) Monthly	008 (04.76)	000	008 (8.60)
	Total	168 (100)	075 (100)	093 (100)
4.	Time spend on internet (on avg.)			
	a) <1 hours	34 (20.24)	17 (22.67)	19 (20.43)
	b) 1-2 hours	69 (41.07)	24 (32)	45 (48.39)
	c) 3-4 hours	29 (17.26)	19 (25.33)	10 (10.75)
	d) >4 hours	36 (21.43)	15 (20)	19 (20.43)
	Total	168 (100)	075 (100)	093 (100)
5.	Internet access on which place* (n=168)			
	a) Mobile	158 (94.05)	69 (92)	89 (95.70)
	b) PC/ laptop	054 (32.14)	54 (72)	27 (29.03)
	c) Cyber café	015 (08.93)	08 (10.67)	04 (04.30)
	d) College library	017 (10.12)	05 (6.67)	00

* = Some has given multiple responses to question.

Slow internet speed (88.69%) and cost (80.36%) were observed most common problem to access internet. Only 27.38% medical students were having correct knowledge of telemedicine, 20.24% were having wrong knowledge and 52.38% were not aware of this term. Interestingly 88.69% medical students feel basic computer science and applications should includes in curriculum. (Table-3)

engine. Similar study conducted by Jadoon *et al* (2011) at Lahore and various other medical college, they found 88.9% medical students were using Google as a search engine. In present study slow internet speed (88.69%) and cost (80.36%) were observed most common problem to access internet. A study conducted by Lal P, Malhotra R (2006) found most common reason for dissatisfaction was slow speed of data

Table 3. Use of internet among medical students (n=168)

Sr.	Characteristics	Total	Male	Female
1.	Use of internet access*			
	a) Academic related	129 (76.79)	53 (70.67)	81 (87.10)
	b) Social sites	137 (81.55)	61 (81.33)	77 (82.80)
	c) Entertainments	112 (66.67)	53 (70.67)	53 (56.99)
	d) Chatting	129 (76.79)	63 (84)	66 (70.97)
	e) Pornography	022 (13.10)	22 (29.33)	00 (00)
	f) Others (railway/shopping/news)	107 (63.69)	37 (49.33)	70 (75.27)
2.	For academic purpose what you do*			
	a) Reading /downloading book	126 (75)	48 (64)	78 (83.87)
	b) Access to articles / journals	056 (33.33)	27 (36)	29 (31.18)
	c) Recent advances in medical field	48 (28.57)	27 (36)	21 (22.58)
3.	Which online search engine do you used*			
	a) Google	168 (100)	75 (100)	93 (100)
	b) Yahoo	05 (02.98)	02 (02.67)	03 (03.23)
	c) Bing	00	00	00
	d) mns	00	00	00
4.	Problem to access internet *			
	a) Cost	135 (80.36)	60 (80)	75 (80.65)
	b) Lack of time	027 (16.07)	03 (04)	24 (25.81)
	c) Lack of skills	012 (07.14)	03 (04)	09 (09.78)
	d) Slow internet speed	149 (88.69)	69 (92)	80 (75)
5.	Knowledge about telemedicine			
	a) Correct	46 (27.38)	16 (21.33)	30 (32.26)
	b) Wrong knowledge	34 (20.24)	15 (20)	19 (20.43)
	c) Not aware	88 (52.38)	44 (58.67)	44 (47.31)
	Total	168 (100)	75 (100)	93 (100)
6.	Do you feel basic computer science and applications should includes in curriculum			
	a) Yes	149 (88.69)	66 (88)	83 (89.25)
	b) No	019 (11.31)	09 (12)	10 (10.75)
	Total	168 (100)	75 (100)	93 (100)

* = Some has given multiple responses to question

DISCUSSION

The present study examined use of internet among medical students studying in Govt Medical College, Akola (Maharashtra-India). In the present study 98.81% were using internet contrast to that study conducted by Jadoon *et al* (2011) at Lahore and various other medical college, they found 84% medical students were using internet. Similar study conducted by Bin Ghouth (2008) at medical college of Hadramout University in Yemen, and found 76.20% were using internet. In present study frequency of use of internet was observed daily in 78% study subjects. Study conducted by Singh B, Gupta R (2013) at AIIMS Jodhpur, observed 51.20% students were using internet daily. Present study shows, 94.2% study subject access internet on their internet enabled mobile, 32.2% % study subject access internet on computer/laptop. A study conducted by Unnikrishnan *et al* (2008) observed that 62% UG medical students access on computer. Present study show 81.55% were using social site followed by academic related site (76.79%). Study conducted by Bin Ghouth (2008) at medical college of Hadramout University in Yemen, and observed that students used internet for general purposes (76.2%) with lesser number using the internet for educational and research purposes (62.4%) for searching medical books, 51.9% for searching medical journals. Present study it was observed 100% medical students were using Google as search

transfer in UG students (83.10%). It is very unfortunate that, around 73% UG students were having wrong or no information about telemedicine. Similar results were obtained in study conducted by Sharma and Verma (2006), they observed 76% UG students were having wrong or no information about telemedicine. In this study, it was found that a large majority (92.5%) of medical students/ interns advocated that computer and its application should be encouraged in teaching institutions which is comparable with the study done in Mangalore by Unnikrishnan *et al.* (2008). Computer assisted teaching is gaining importance in the medical field as students can be shown various procedures, demonstrations, surgeries etc.

Conclusion

It is concluded that the use of internet is widespread among medical students, so it is needful to include short subject/courses in basic computer science and its application in curriculum of medical students to fully utilize online resources to improve their learning and quality of patient care. Increase in awareness, availability of requisite facilities and training in computing skills will enable optimum utilization of digital resources by students. This will be helpful in promoting evidence based learning. In addition to that the beauty of internet is that, it allows students the convenience of studying at their own pace and place.

REFERENCES

Alghamdi, K.M 2009: Professional use of the internet among Saudi Arabian dermatologists: a cross-sectional survey. *BMC Dermatol*, 9:10.

Bin Ghouth, A.S, 2008. Using Computer and Internet for Medical Literature Searching Among Medical Students in Hadramout University, Yemen. *Online J Health Allied Scs.*7(1):6.

Demiris, G, Afrin L. B, Speedie, S, Courtney, KL, Sondhi, M, Vimarlund, V, Lovis, C, Goossen, W, Lynch, C, 2008: Patient-centered applications: use of information technology to promote disease management and wellness. A white paper by the AMIA knowledge in motion working group. *J Am Med Inform Assoc*, 15(1):8-13.

Dutta-Bergman, M. J 2004: Health attitudes, health cognitions, and health behaviours among Internet health information seekers: populationbased survey. *J Med Internet Res*, 6(2):e15.

Hong, C.H, Mclean, D, Shapiro, J, Lui, H 2002: Using the internet to assess and teach medical students in dermatology. *J Cutan Med Surg*, 6(4):315-9.

Jadoon, *et al*. 2011: Evaluation of internet access and utilization by medical students in Lahore, Pakistan. *BMC Medical Informatics and Decision Making* 11:37.

Jones, S, 2002. The Internet Goes to College, Internet and American life Sep 15 [available from http://www.pewinternet.org/]

Lal P, Malhotra R, Ahuja C, Ingle GK. 2006. Internet use among medical students and residents of a medical college of north India. *Indian J Community Med*. 31:293–4

Majeed,, A, 2003: Ten ways to improve information technology in the NHS. *BMJ* 2003, 326(7382):202-206.

Romanov, K. and Aarnio, M. 2006. A Survey of the Use of Electronic Scientific Information Resources among Medical and Dental Students, *BMC Medical Education*, 6, pp. 28.

Sharma, R, Verma, U, Sawhney, V, Arora, S, Kapoor, V. 2006. Trend of Internet use among medical students. JK Science: *Journal of Medical Education and Research*. 8:101–2.

Singh B, Gupta R, Garg R. 2013. Study of medical students and internet usage. *International Journal of Scientific and Research Publications*. (5):1-5.

Skinner, H, Biscope, S, Poland, B, 2003: Quality of internet access: barrier behind internet use statistics. *Soc Sci Med*, 57(5):875-80.

Turner, J.W, Robinson, J.D, Alaoui, A, Winchester, J, Neustadtl, A, Levine, B.A, Collmann, J, Mun, S.K 2003: Media attitudes vs. use: the contribution of context to the communication environment in telemedicine. *Health Care Manage Rev*, 28(2):95-106.

Unnikrishnan, B, Kulshrestha, V, Saraf, A, Agrahari, AC, Prakash, S, Samantaray, L, *et al*. 2008. Pattern of computer and internet use among medical students in coastal south India. *South East Asian Journal of Medical Education*. 2:18–25.

Virtanen, J. I, Nieminen, P 2002: Information and communication technology among undergraduate dental students in Finland. Eur J Dent Educ, 6(4):147-52.

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