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Use of Information Technology Among Undergraduate Medical Students.

[1*]S Bharat, [2] B Srivastava, [2] S Gaur, [2] R Bhardwaj, [2] R Khanchandani

[1] PG JR, Deptt of Pharmacology, [2] Deptt of Pharmacology

Government Medical College, Haldwani Nainital, Uttarakhand.

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Corresponding Author:

S Bharat

PG JR Department of Pharmacology Government Medical College & Hospital Haldwani, Distt- Nainital (Uttarakhand) India.

Email: dr.suyash.bharat@gmail.com

ABSTRACT

The present cross sectional study was conducted at Government Medical College Haldwani among undergraduate students to assess their use of computer/ laptops/ smart phones, knowledge and attitude towards internet use. The study was carried out in the Government Medical College, Haldwani, Nainital, among undergraduate medical students. The questionnaire included questions about demographic data, computer/laptop/smart phones and internet use. The questionnaire was collected immediately after completion to minimize interpersonal communication. Obtained result was calculated, tabulated and analyzed. 88.17% of the students were using computer/laptop. The purposes stated for using internet was to get general information (30.11%), learn about important facts (26.22%) and others to entertain and pass times. Most of them had computer and internet in their hostel (41.39%) equal number used it in cyber cafe (41.39%) and rest even in college or friend's computer. 88.14% had knowledge about telemedicine and computer assisted learning. 37.63% students internet was the preferred medium for information and 19.35% preferred textbooks for advanced information. 73.54% students own a application smart phone/ hand-held computing devices. Out of which 58.125% students use medical related application on their computing devices/smart phones. 37.29 % and 22.5% students occasionally and often use smart phones for searching drug reference/ medical formulation. We also conducted computer assisted simulation of animal experiment exercise in experimental pharmacology 48.125% students find it very helpful and interesting.

It is urgently required to introduce short refresher courses in computer application and internet use both among Undergraduate and Post Graduate students. Students should be trained to extract valuable information from internet and authenticity of information by correlating with existing evidences.

KEY WORDS – Medical education, laptops, smart phones.

INTRODUCTION

Handheld computing devices are changing health care delivery. Clinicians now have instant access to vast amounts of information, including x-ray results, laboratory tests, and databases of primary and pre-appraised research, clinical practice guidelines, and drug reference guides. The evolution of handheld computers— smaller, more versatile, and capable of Internet connectivity—has prompted increasing usage by health care professionals. The Internet has become the world's biggest library, where retrieval of scientific resources can be done within minutes. 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. Within the healthcare population, the utilization of smart phone and other mobile devices, such as the personal digital assistant (PDA) and handheld tablets, has the potential to have a positive impact upon patient care. Specifically, by providing personnel with immediate access to medical and health information, this technology can lead to improved decision-making and reduced numbers of medical errors, improved communication between hospital medical staff and enhanced telemedicine capability. For medical students, the Internet offers a great potential to meet their academic needs and to promote learning. The present cross sectional study was conducted at Government Medical College Haldwani among undergraduate students to assess the computer use, knowledge and attitude towards internet use among medical students.

Materials and Methods

The study was carried out in the Government Medical College, Haldwani Nainital, among undergraduate medical students among them 239 girls and 241 boys using the retrospective method. 480 questionnaires were received from the students of which 15 were not properly answered and so rejected. The questionnaire included questions about demographic data, computer/laptop/hand-held computing devices/ application smart phone and internet use. The questionnaires were collected immediately after completion to minimize interpersonal communication among the subjects and to prevent the influence of friends on individual responses. The informed consent of the student was also obtained. The result was calculated in percentage then tabulated and analyzed.

Result

Demographic characteristics

Out of the 480 students who answered the questionnaire, there were 239 girls and 241 boys.

Opinion regarding computer and internet use (table 1)- 88.17% of the students were using computer and 11.83% of them never used computer. More than half the students owned computer/ laptop. (fig.1). The purposes stated for using internet was to get general information (30.11%), learn about important facts (26.22%) and others to entertain and pass times (fig-2). Most of them had computer and internet in their hostel (41.39%) equal number used it in cyber cafe (41.39%) and rest even in college or friend's computer. 20.43 % used internet always but majority use internet sometime (60.28). 88.14% had knowledge about telemedicine and computer assisted learning. 37.63% students internet was the preferred medium for information and 19.35% preferred textbooks for advanced information (fig-3).

Opinion regarding hand-held computing devices/ application smart phone use (table2)

353 (73.54%) students own an application smart phone/ hand-held computing devices (fig-1). Out of which 279(58.125%) students owned medical related application on their computing devices/smart phones like (Medscape, Google scholar, pubmed etc). 179(37.29 %) and 108 (22.5%)students occasionally and often use smart phones / PDA for searching drug reference/ medical formulation. 160(33.33%) students' occasionally and 160 (33.33%) students' often use their smart phones / PDA for looking into disease diagnosis and management in clinic hours. (Fig -4) (Table 1).

We also conducted computer assisted simulation of animal experiment exercise in experimental pharmacology 48.125% students find it very helpful and interesting, 19.375% students find it helpful, while 27.083 students prefer real animal experiments better. (Fig-5)

We also asked the opinion of students regarding MCI-VISION 2015, 2month foundation course in 1st year MBBS and 68.958% student think of the course Benificial. (Fig-6)

Table 1: Opinion regarding computer and internet use

Parameter	Number /percentage of students
Own a computer	
1. yes	58.01% (278)
2. no	41.99% (202)
Own a application smart phone/ PDA	
1. yes	73.54%(353)
2. no	26.46%(127)
Purpose for using computer	
1. general information	30.11%(140)
2. important facts	26.22%(108)
3. entertain and pass time	21.50%(100)
4. communication	18.27%(85)
5. other	3.90%(30)
Preferred medium for information / reference	
1. text book	19.35%(90)
2. journal	21.50%(100)
3. library	21.50%(100)
4.internet	37.63%(175)
Computer assisted simulation of animal experiment exercise in experimental pharmacology	
1. Very helpful and interesting.	48.125%(231)
2. Helpful	19.375%(93)
3. OK but real animals would be better	27.08%(130)
4. Not helpful	5.42%(26)

Table 2 (fig -4) Opinion regarding hand-held computing devices/ application smart phone use

Purpose	Percentage/Number of students using smart phones/ computing devises for-				
	Not used	Occasionally used	Often used	Very often used	Used constantly
Medication formulation / drug reference	35.62%(171)	**37.29%(179)**	22.50%(108)	2.29%(11)	2.29%(11)
Clinical score system/ medical calculator	**81.46%(391)**	7.71%(37)	6.25%(30)	3.96%(19)	0.62%(3)
Disease diagnosis / management	24.79%(119)	**33.33%(160)**	**33.33%(160)**	4.58%(22)	3.96%(19)
Procedure documentation	**61.25%(294)**	20.21%(97)	13.96%(67)	3.96%(19)	0.62%(3)
Web access	23.125%(111)	22.50%(108)	**27.92%(134)**	14.79%(71)	11.67%(56)
Email access	29.375%(141)	17.92%(86)	**34.17%(164)**	8.54%(41)	10%(48)

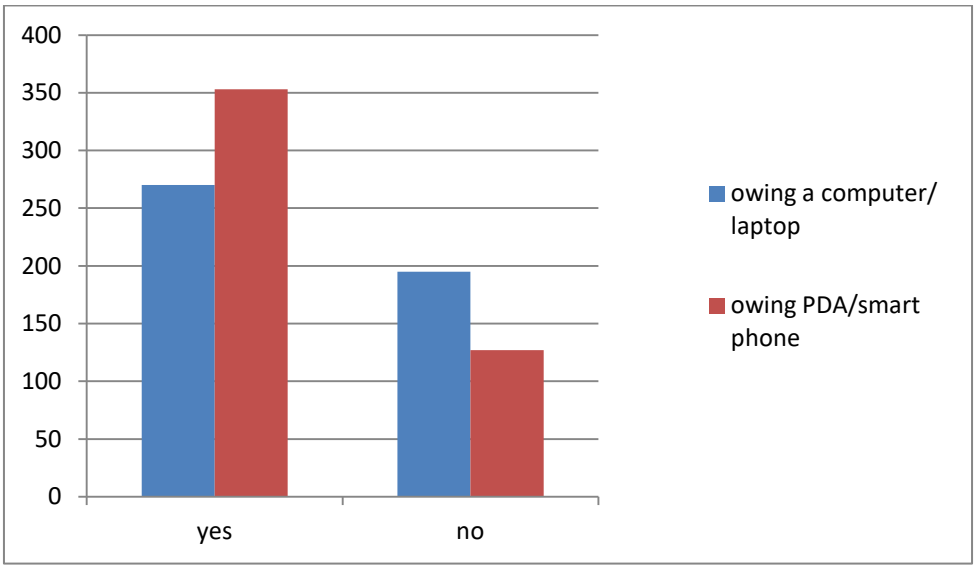

Figure 1 : Percentage of students owing computer/laptop and smart phone.

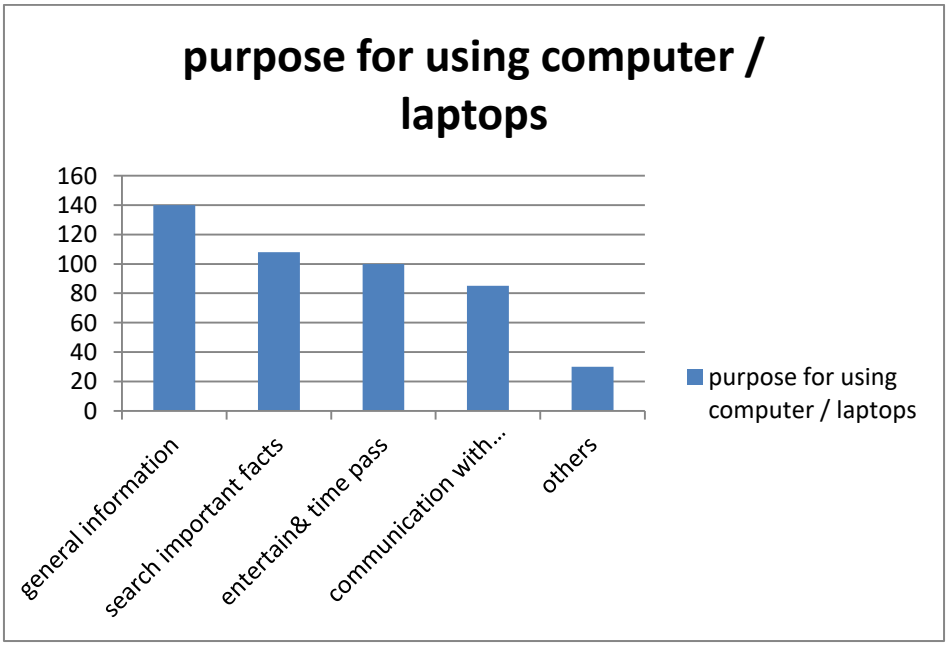

Figure 2: Number of students using computer/laptop for which purpose.

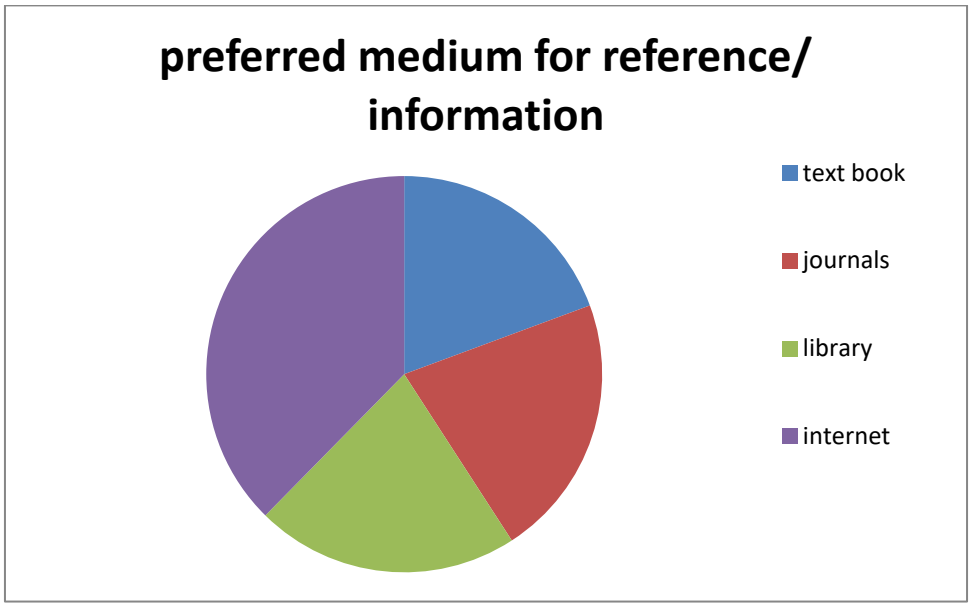

Figure 3: Preferred medium for reference / information.

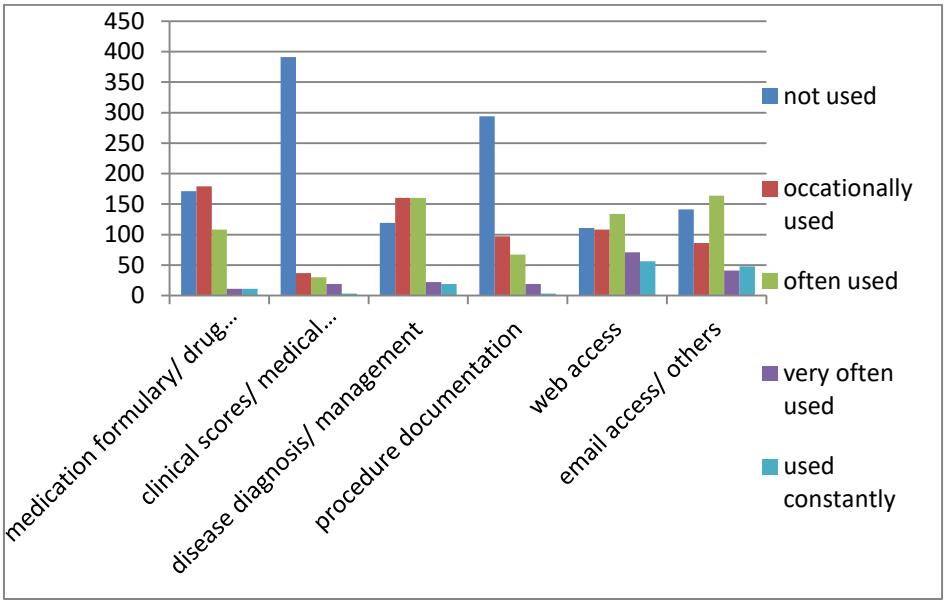

Figure 4: Opinion regarding hand-held computing devices/ application smart phone use.

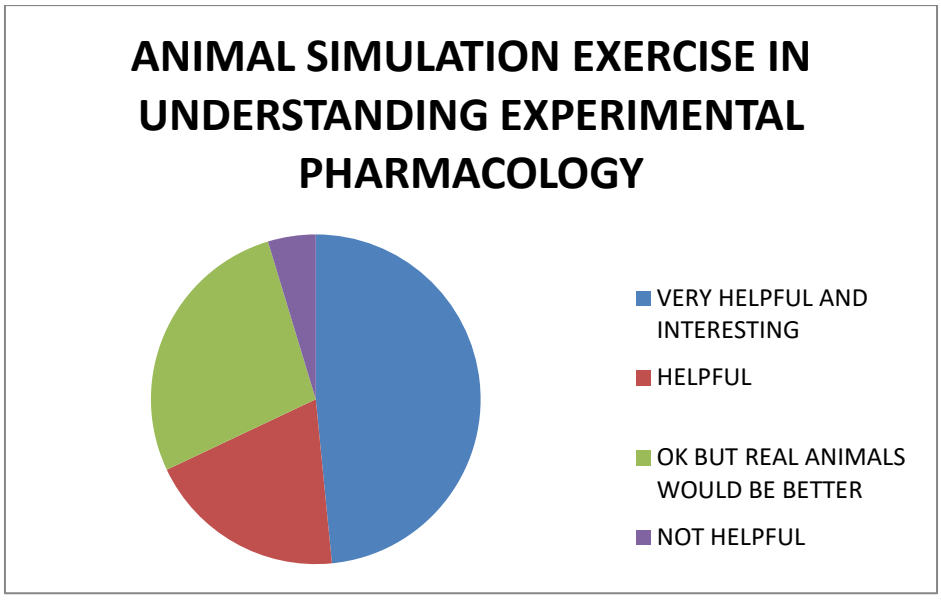

Figure 4: Percentage of students' opinion on computer assisted simulation of animal experiment exercise in experimental pharmacology.

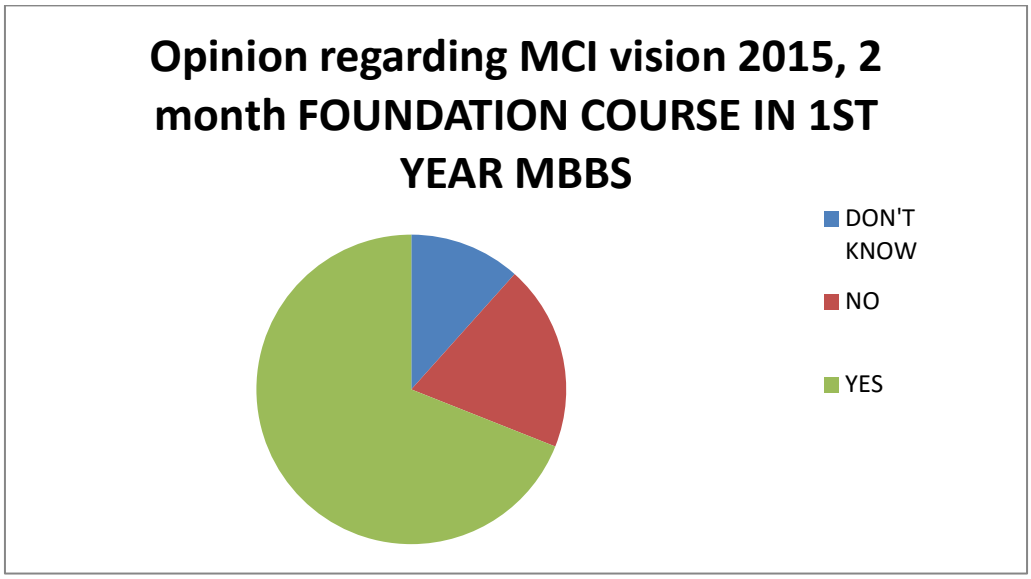

Figure 5: Opinion regarding MCI vision 2015, 2 month foundation course in 1st year MBBS.

Discussion

By the use of telemedicine, broad band high capacity network connection, we can cross these barriers to provide timely medical care in the remotest corners of the country .And with the use of PDAs revealed a positive attitude towards the PDA, which was regarded as a feasible and convenient tool. The possibility of immediate access to medical information has the potential to improve patient care[1]. The substantial growth in mobile handheld technologies has heralded the opportunity to provide physicians with access to information, resources, and people at the right time and place. The use of PDAs demonstrates the greatest benefits in contexts where time is a critical factor and a rapid response crucial [2]. And as stated Telemedicine is the specialty of medicine that uses the evolving telecommunications industry combined with medical information technology to provide remote medical services[3] Routine adoption of Smartphone by residents appeared to improve efficiency over the use of pagers for physicians, nurses, and allied health professionals[4,5]. And as we are upgrading in every field so no way doctors would lag behind , Innovative educational technologies, such as e-learning, simulation and smart phones, provide unprecedented opportunities for health and social care students, trainees and staff to acquire, develop and maintain the essential knowledge, skills, values and behaviors needed for safe and effective patient care. We believe that the technology has evolved and disseminated to where spontaneous use of this technology may provide more rapid exchange of information between clinicians[6].

In India students enter medical college after more than twelve years of schooling. The students at GMC Haldwani are in age group of 18-25 years. The response rate was very high which showed great interest of medical student in computer/ laptop/ computing devices and internet use. The overall impression was that medical students have comparable computer literacy skills and availability of computing devices and internet at homes / hostels was similar to that of various studies done in different countries. More over the health and financial resources in developing countries like India are limited and unevenly distributed [7]. In addition geographical and socioeconomic factors prevent rapid transfer of information in the age of internet.

Smartphone use is ideal for medical students as it allows easy access to material within seconds, which would take longer searching a textbook. Smart phones will soon be universally owned among the medical profession and offer a real opportunity to impact on the efficiency of working practices and patient care with minimal capital outlay for healthcare organizations [8, 9]. Handheld computers have demonstrated effectiveness for supporting health care professionals' information seeking needs. Where PDAs were used for self-directed learning, medical students perceived time saving, reported being better able to inform patients about medication use when looking at drug reference data. Further research should focus on designing and implementing computer and Internet training for medical students[9].

Conclusion

It is urgently required to introduce short refresher courses in computer application and internet use both among Undergraduate and Post Graduate students. Students should be trained to extract valuable information from internet and authenticity of information by correlating with existing evidences.

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