

# Internet usage among undergraduate dental students in India

## Uso da Internet entre alunos de Odontologia na Índia

### Abstract

**Purpose:** To assess the internet usage among dental students at a private dental institution in India.

**Methods:** Internet usage was assessed among the first- to senior-year undergraduate dental students at the Darshan Dental College and Hospital, Udaipur, India. The study was conducted during the beginning of the academic year 2007-2008. Data were collected by using a questionnaire, which consisted of nine multiple choice questions. The chi-square test was used to compare the responses between male and female students and to analyze the difference among year classes.

**Results:** The total sample size was 247, and the overall response rate was 66%. Only 5.7% and 4.1% of the students used the internet daily for general and dental purposes, respectively. More than half the subjects (55.5%) never used the internet for academic purposes in comparison to 9.3% for general use. Nearly half of the subjects preferred home for internet access; only 7.9% accessed the internet at school. About 60% of the subjects used search engines to access dental subjects, and the students from clinical years used the search engines for dental education more often than the preclinical students (78% versus 41.2%,  $P=0.001$ ).

**Conclusion:** Dental students at this private dental institution in India reported lower levels of internet use than students in other countries, which may be due to limited access and availability at the present institution.

**Key words:** Internet; dental, education; India; information

### Resumo

**Objetivo:** Este trabalho avaliou o uso de Internet entre estudantes de Odontologia em uma instituição privada na Índia.

**Metodologia:** O uso de Internet foi analisado entre 247 alunos do primeiro ao último ano do curso de Odontologia de Darshan Dental College and Hospital, Udaipur, na Índia. O estudo foi realizado no início do ano acadêmico de 2007-2008. Os dados foram coletados através de um questionário com nove perguntas de múltipla escolha. O teste qui-quadrado foi utilizado para comparar as respostas entre os sexos masculino e feminino e para analisar as diferenças entre os alunos de classes diferentes.

**Resultados:** O tamanho da amostra foi de 247 sujeitos, com uma taxa de resposta total de 66%. Somente 5.7% e 4.1% dos estudantes utilizavam diariamente a Internet para pesquisa com finalidades gerais e odontológicas, respectivamente. Mais da metade dos alunos (55.5%) nunca usou a Internet para finalidades acadêmicas em comparação com 9.3% das respostas para uso geral. Quase a metade dos alunos preferiu acessar a Internet de sua residência; somente 7.9% utilizavam a Internet na faculdade. Cerca de 60% dos alunos utilizou as ferramentas de busca da Internet para obter material relacionado a assuntos de Odontologia, sendo que os estudantes dos últimos anos utilizavam mais a Internet para assuntos acadêmicos que os alunos dos anos pré-clínicos (78% vs. 41.2%,  $P=0,001$ ).

**Conclusão:** Os estudantes de Odontologia desta instituição na Índia relataram menores níveis de utilização da Internet que alunos de outros países. Isso pode ser devido a acesso e disponibilidade limitados na instituição avaliada.

**Palavras-chave:** Internet; educação em Odontologia; Índia; informação

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## Introduction

The internet was originally developed by the United States of America's military in the 1960's as a means of ensuring a workable communication system in the event of a strike by enemy missiles or forces (1). At present, it is making substantial inroads in research (2), patient care (3,4), education (5) and dissemination (6,7) of healthcare information.

Moreover, the development of the internet as a vehicle for world-wide communication and the emergence of the World Wide Web have made instantaneous access to much of the entire body of medical information an exciting tool. It is now one of the most important sources of information for students of institutions of higher education throughout the world by providing access to education materials (8).

In developed countries the internet usage in healthcare is well-established, while in most parts of the developing world the internet use and literacy rates are low and slowly improving. The current emphasis on evidence-based healthcare may increase the need for computer use and internet connections in dental practice. Online databases (e.g., PubMed, Cochrane Database and MEDLINE) are key tools in the search for the best evidence, and their use depends on computer knowledge and internet access. Also, an increasing number of journals offer online access to full content of scientific and clinical interest. Recent studies have shown that the use of computerized information systems by medical professionals can improve the quality of care, enhance the use of evidence-based treatments and update the clinical knowledge (9,10).

The greatest challenge to increased adoption of internet-based information in developing countries like India is limited financial resources. Recently, general internet usage has increased in India, and is anticipated that this increase would be reflected among health personnel for education and clinical practice purposes. Though there are few surveys that have reported the computer literacy among the medical college students and health professionals in India, we were unable to trace any survey that assessed the internet practices among dental students. Thus, the present study aimed to assess the internet usage among dental students at a private dental institution in India.

## Methods

The study population consisted of the dental undergraduate students enrolled at the Rajasthan University of Health

Sciences, pursuing their career at the Darshan Dental College and Hospital, Udaipur, India. The research protocol was approved by the Institutional Review Board, and verbal consent was obtained from the respondents.

The study was conducted in the beginning of the academic year 2007-2008. All undergraduate dental students enrolled in the first to senior years were requested to participate in the study except for the interneers attending the compulsory rotation internship. The students who were absent on the days of the survey were excluded from the study.

The Internet usage was assessed by using a questionnaire derived from a previous survey (11), which consisted of nine multiple choice questions. Besides specific question on Internet access and usage, the students were requested to record their age, gender and class (year of study). The questionnaires were distributed by one of the authors (SK) during one lecture for each class with previous permission from the Dean of the institution, and the aims of the study were explained to all respondents. The data collected was recorded on spread sheets and analyzed using a statistical package for social sciences (SPSS 11.0). The chi square test was used to compare the responses between the gender groups (male vs. female) and to analyze the differences among dental classes according to year of dental education.

## Results

The total sample size was 247 with an overall response rate of 66%. Individual response rates for each year according to gender were: first year (males: 72%, females: 56%), second year (males: 62%, females: 81%), third year (males: 63%, females: 65%) and final year (males: 64%, females: 64%). There was no statistically significant difference in gender distribution among the dental classes (years of study) ( $P=0.070$ ).

### Internet usage

As presented in Table 1, only 5.7% and 4.1 of the dental students used the Internet daily for general and dental purposes, respectively. More than half of the subjects (55.5%) had never used the Internet for academic purposes in comparison to 9.3% of the students that used the Internet for general searches. Male students used the Internet for both dental ( $P=0.001$ ) and general purposes ( $P=0.0001$ ) more often than females.

**Table 1.** Distribution of the responses of the dental students to the questionnaire items on internet usage.

	How often do you use internet for general purposes		How often do you use internet for dental purposes	
	N	%	N	%
Every day	14	5.7	10	4.0
Two to three times a week	34	13.8	14	5.7
Once a week	41	16.6	19	7.7
Once a month	81	32.8	21	8.5
Once in a couple of months	54	21.9	46	18.6
Never	23	9.3	137	55.5

The majority of the students in the clinical years used the Internet more often for dental education purposes than the preclinical students, but no statistically significant difference was found among the dental classes.

#### Place and reasons for using and not using the Internet

Table 2 shows that nearly half of the subjects reported that they prefer to access the Internet from home, followed by at an internet café, and only 7.9% accessed the Internet at school. For 48% of the respondents, the Internet was a medium of entertainment and only 5.2% used it for dental information. Lack of time was a prominent factor that prevented students from using the Internet.

**Table 2.** Distribution of the responses of the dental students to questionnaire items about places of access and reasons for using or not using the Internet.

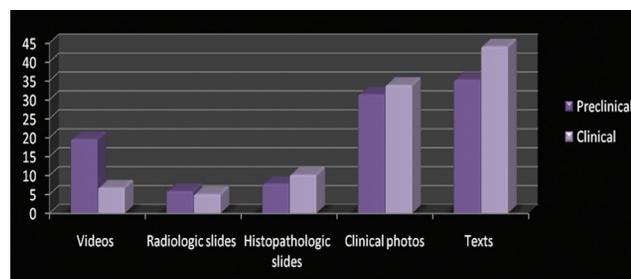
Item #	Question	N	%
3	The place you prefer for Internet access		
	Internet cafe	76	33.2
	School/library	18	7.9
	Home	119	52
4	The reason for Internet access		
	Email	31	13.5
	Entertainment	110	48
	General information	76	33.2
	Dental information	12	5.2
5	Factors for not using the Internet		
	Difficulties to access the Internet	31	12.6
	Cost	50	20.2
	Lack of time	117	47.4
	Do not know how to use	13	5.3
	Other reasons	36	14.6

#### Access to dental information

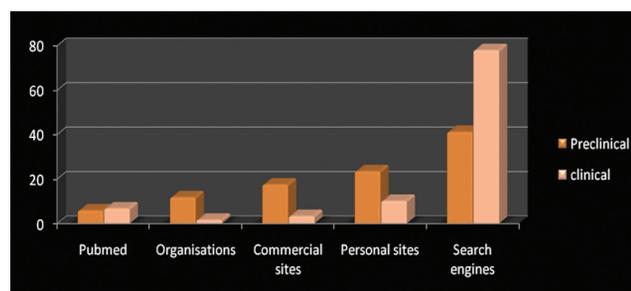
Table 3 illustrates that English sites were the first choice for dental information access in comparison with other language sites, and 58.2% had never accessed other language sites for dental information. Nearly half of the students preferred to collect texts, followed by clinical photos and videos; the Chi square analysis revealed no significant differences between gender groups or among classes in relation to sources preferred to obtain information on dental topics (Fig. 1). Approximately 60% of the subjects used search engines to access dental information, and more students of the clinical years used the Internet search engines for dental education in comparison with the preclinical students (78% vs. 41.2%,  $P=0.001$ ) (Fig. 2).

**Table 3.** Responses to questionnaire items on dental information access

Item #	Question	N	%
6	How frequently you access dental information in English-language sites		
	Very frequent	12	10.9
	Frequent	36	32.7
	Rare	29	26.4
	Very rare	13	11.8
7	How frequently you access dental information in other language sites		
	Very frequent	7	6.4
	Frequent	15	13.6
	Rare	12	10.9
	Very rare	12	10.9
8	Sources in the Internet preferred to gain information on dental subjects		
	Videos	14	12.7
	Radiologic slides	6	5.5
	Histopathologic slides	10	9.1
	Clinical photos	36	32.7
9	Internet sites used to access dental subjects		
	Texts	44	40
	PubMed	7	6.4
	Organizations	7	6.4
	Commercial sites	11	10.0
	Personal sites	18	16.4
Search engines	67	60.9	



**Fig. 1.** Preferred dental material retrieved from the Internet sources by dental students in the preclinical and clinical classes.



**Fig. 2.** Types of Internet sites used to access dental subjects among dental students of the preclinical and clinical classes.

**Table 4.** Internet usage frequency and reason for internet access by course and gender.

	By Class			By Gender		
	Pre clinical % (N)	Clinical % (N)	P	Male % (N)	Female % (N)	P
How often do you use the Internet for general purposes						
Every day	3.1% (4)	8.4% (10)	0.053	10.4% (11)	2.1% (3)	0.0001
Two to three times a week	17.2% (22)	10.1% (12)		17.0% (18)	36.2% (51)	
Once a week	17.2% (22)	16.0% (19)		22.6% (24)	12.1% (17)	
Once a month	37.5% (48)	27.7% (33)		31.1% (33)	34.0% (48)	
Once in a couple of months	6.2% (21)	27.7% (33)		14.2% (15)	27.7% (39)	
Never	8.6% (11)	10.1% (12)		4.7% (5)	12.8% (18)	
Total	(128)	(119)		(106)	(141)	
How often do you use the Internet for dental purposes						
Every day	3.9% (5)	4.2% (5)	0.126	5.7% (6)	2.8% (4)	0.001
Two to three times a week	3.9% (5)	7.6% (9)		10.4% (11)	2.1% (3)	
Once a week	10.2% (13)	5.0% (6)		11.3% (12)	5.0% (7)	
Once a month	9.4% (12)	7.6% (9)		12.3% (13)	5.7% (8)	
Once in a couple of months	13.3% (17)	24.4% (29)		11.3% (12)	24.1% (34)	
Never	59.4% (76)	51.3% (61)		49.1% (52)	60.3% (85)	
Total	128	119		106	141	
The main reason for the internet access						
Email	13.3% (16)	13.8% (15)	0.697	7.9% (8)	18.0% (23)	0.001
Entertainment	45.0% (54)	51.4% (56)		61.4% (62)	37.5% (48)	
General information	36.7% (44)	29.4% (32)		23.8% (24)	40.6% (52)	
Dental information	6% (5)	6% (5)		6.9% (7)	3.9% (5)	
Total	120	109		101	128	

## Discussion

The present results from this sample of dental students in India showed that 7.3% of the subjects stated that they have never used the Internet, and 90.7% and 44.5% of the subjects used the Internet for general and dental purposes, respectively, which is greater than the rates reported in previous studies in other countries, such as 58% of medical students in Lagos, Nigeria (12), and 53% of dental students in U.K. (13). However, only 5.7% used the Internet on a daily basis, which is below the rates of use among dental students in Finland (33%) (14), but it is in accordance with the reported figures among dental students in Ireland (8%) (15). The majority of students in the clinical years used the Internet for dental purposes more often than the preclinical students, which is explained by the amount of work that requires literature search for projects, clinical seminars and presentations during the clinical years of study. Many more male students used the Internet for both dental and general purposes in comparison with females, which is in accordance with previous studies in Europe (16) and Turkey (11). Nearly half of the subjects reported that they prefer to access the Internet at home, and only 7.9% of the students accessed the Internet at school. Limited accessibility and availability of the Internet at the University campus might be the reason for the students preferring their homes and internet cafes.

Entertainment was the most popular Internet service used by the respondents followed by general information and email, which is in contradiction to previous studies where e-mail was used by 97.3% of the undergraduate medical students enrolled in an institution of higher education in India. Similarly, the Internet was used for email exchange by 75.7% of the medical and student nurses in Nigeria (18) and 78% of the medical students in Malaysia (19). It has been observed that the use of email as a means of communication would reduce the unnecessary consultation time of faculty with students. However, among the medical students of a medical school in India it was observed that the majority of the students accessed the Internet for education purposes followed by e-mail use (20).

In the present study 7.7% of the dental students accessed the Internet for dental information at least once a week, and 8.5% at least once in a month, which is in strong disagreement with the rates of 20% and 40% among Turkish dental students (11) and of 26% and 83% of Britain dental students (13), respectively. English sites were more cited for dental information searches than other language sites, and 58.2% had never accessed other language sites for dental information in India. In the country there are very few non English sites available that provide dental information, and all the dental students in this sample were proficient in English language.

The preferred material retrieved from Internet sites by nearly half the students were texts followed by clinical photos and videos. About 60% of the subjects used general search engines to access dental topics using key words, but the major limitation of these search engines are that they do not offer filters to refine the search. PubMed was used by only 6.4% of the respondents, and clinical students preferred to use it more than the preclinical students to get references of journal articles. The major drawback of PubMed is that it can provide only abstracts although it is a bibliographic database considered the primary source for biomedical journal literature. This might be one of the reasons that prevented the students from using this online journal database more often to get dental information and other clinical material.

When interpreting the results of the present study, some confounding factors need to be considered. The data are limited to one dental institution in India, where the utilization of Internet may have local characteristics such

as limited access to the Internet and availability of computers to dental students. Additionally, the response rate of the survey was moderate, and some results of Internet usage may have been underestimated. Further research is needed to explore the students' use and acceptance of this technology for educational purposes and evaluate how their attitudes are likely to affect the implementation and success of new strategies of dental education with Internet-based learning.

## Conclusions

Although the Internet is considered an important source for medical information, dental undergraduate students at this dental institution in India have not fully utilized the Internet resources in the learning process. The dental students reported lower levels of Internet use than their counterparts in other countries, which may be due to the limited access and availability of Internet connection at the present institution.

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