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## Use of the Internet and Electronic Resources for Dental Science Information: A Case Study

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### Introduction

Sources of information available via the Internet are increasing exponentially (Asemi, 2005). This comes with a steady increase in Internet use for education (Edwards and Bruce, 2002) and for research. The Internet is also making substantial inroads in patient care and dissemination of health care information. It is changing the way health sciences professionals obtain information. They use the Internet and electronic resources to do things like accessing medical records, providing remote patient care through telemedicine facilities, and accessing health care literature (Joos, et al., 2006). Dentists also depend more and more on the Internet. Dental product information, continuing education resources, online supply catalogs, and reference information have made Internet increasingly popular in dentistry (Schleyer, Spallek and Torres-Urguidy, 1998). The present study is an attempt to examine the role of the Internet and electronic resources in dental colleges and hospitals of Punjab, India.

### Literature Review

The Internet is widely used in medicine and has made an impact in research, training, and patient care (Ajuwon, 2006). A review of literature reveals the use of Internet and electronic resources for patient care. Physicians use the Internet and electronic information resources to obtain answers to patient-specific questions and to keep abreast of developments in clinical medicine (Thompson, 1997; Koller et al., 2001).

Schleyer, Spallek, and Torres-Urguidy (1998) developed a profile of current Internet users in dentistry (that is, professionals who either subscribed to dental discussion lists or who frequented dental websites with high traffic) dentists, assistants, hygienists, dental students, and educators. The study reported that respondents used the Internet for discussing clinical cases, obtaining diagnostic and therapeutic information, buying dental products, communicating with patients, and participating in continuing education. A majority of the respondents (80%) considered the Internet to be a useful or very useful resource in dentistry.

Nicholas, et al. (2003) conducted a study in the UK to examine the use of the web for health information and advice. More than 1,300 people were surveyed. The study showed that 66% of the respondents accessed the Internet from home, 28% from work, and the remainder (6%) used a combination of both work and home.

Rehman and Ramzy (2004) conducted a study on the Internet use by health professionals at the health sciences centre (HSC) of Kuwait University. The study showed that 92.1% of the respondents

accessed Internet from their office, while 73.2% also accessed it from home. Another 28.3% also used the HSC Library for accessing the Internet. The study indicated that 80.3% of the respondents used Internet daily, 15% used it once a week and 2.5% used it once a month. 88.2% of the respondents felt that the Internet provided better access to health sciences information, 77.2% indicated that through the Internet they had better professional contacts and 57.5% stated that with the use of Internet they were able to use different channels of communication for their patient care and research.

Asemi (2005) did a case study of Medical Sciences University of Isfahan (MUI), Iran. The results of the study showed that all the respondents used the Internet frequently because all faculties had an Internet connection. It was revealed that the researchers of the university were getting quality health information and patient care through the Internet. Fifty-five percent of respondents searched for scientific health information through the Internet because the university library provided access to databases and online journals students and staff.

Ajuwon (2006) conducted a study of the physicians' use of the Internet for health information for patient care at the University College Hospital (UCH) Ibadan, Nigeria. The findings revealed that 98% of the respondents had used the Internet. A majority (76%) accessed the Internet from cyber cafes. Ninety percent reported that they had obtained information from the Internet for patient care; of this number, 76.2% had searched a database.

Chestnutt and Reynolds (2006) conducted a study of 457 dentists in Wales to identify how patient information on the Internet has influenced the delivery of oral care and the use practitioners make of the Internet. Thirty-nine percent of respondents agreed that information gained from the Internet had led to patients demanding inappropriate care.

The literature shows that use of the Internet and electronic resources is increasing rapidly and are useful components for delivery of quality health sciences information for patient care and evidence-based medicine. In developing countries, the Internet is still only available to a minority of health professionals, and often it is not available at the point of care. India is also a developing country. At present, India has 60,000,000 Internet users, which comprises 13% of Asia's total Internet use population (461,703,143 users, which is 37% of the world's Internet users) (Internet World Stats, 2007). An earlier study conducted by the investigator found that the Internet had become a vital instrument for teaching, research, and learning in engineering colleges of three states of India, i.e., Punjab, Haryana, and Himachal Pradesh (Kumar and Kaur, 2006). The present study is focused on the use of the Internet and electronic resources in dental colleges and hospitals of Punjab, India.

## **Scope of the Study**

The scope of study is limited to the dental sciences colleges and hospitals affiliated to Baba Farid University of Health Sciences, Faridkot, and functioning within the territorial jurisdiction of Punjab State of India. The study includes ten dental colleges and hospitals of Punjab, India (Appendix – I).

## **Objectives**

The objective of this study was to analyze the patterns of use of Internet and electronic resources for patient care, the Internet skills of the dentists, and problems faced by them while using the Internet and electronic resources. The study was conducted to find the satisfaction derived by the researchers with the Internet and electronic resources and to find an answer to the question: Can Internet and electronic resources replace print resources?

## Methodology

A questionnaire (comprising 25-items) was designed, and was pre-tested before using it for the survey. All dental sciences teachers and students were given the same questionnaire. Some respondents willingly filled out the questionnaire but some showed reluctance. The respondents were interviewed to fill in gaps.

The questionnaire was distributed to 200 respondents. Twenty respondents were selected randomly from each college (ten dental sciences teachers and ten dental sciences students) under study. One hundred seventy-one questionnaires (i.e. 75 from the teachers and 96 from the students) were received back. The overall response rate of the survey was 85.5%.

## Data Analysis and Findings

**Table I : Demographic profile of respondents (N=171)**

Variables	%	Number
Age (in years)		
15-20	34	19.9
21-25	59	34.5
26-30	39	22.8
31-35	29	17.0
36 and above	10	5.8
Gender		
Male	96	55.6
Female	75	44.4
Status/ Designation		
Teachers	75	44.4
Students	96	55.6
Total	171	100

Table I depicts the demographic profile of the respondents. The majority of the respondents were ranged 15 to 25 age groups. There were more males (55.6%) than females (44.4%). The dental students constituted the majority (55.6%).

**Table II : Number of respondents having own personal computer or laptop (N=171)**

Question Do you own a personal computer or laptop?	%	Number
Yes	73.7	126
No	26.3	45
Total	171	100.0

The study revealed that majority of the dental teachers and students (73.7%) under study have their own personal computers or laptops.

**Table III : Experience of Internet use (N=171)**

Variables	%	Number
1-3 Years	39.8	68
3-5 Years	38.6	66
5 Years and above	21.6	37
Total	100.0	171

Table III shows that on an average majority of the respondents have ranged 1 to 5 years experience of Internet use. Only 21.6% have more than 5 years of experience of Internet use.

**Table IV : Level of Internet and computer literacy (N=171)**

Variables	Number	%
Expert	7	4.1
Average	119	69.6
Below Average	45	26.3
Total	171	100.0

The respondents were asked to indicate their level of Internet and computer literacy. It is evident from Table IV that majority of the respondents (69.6%) have an average level of Internet and computer literacy. 26.3% of the respondents reported that they have below average level of Internet and computer literacy. Only 4.1% admitted that they are expert in computer and Internet searching techniques.

**Table V : Methods of learning Internet skills (N=171)**

Variables	Number	%
Trial and Error	97	56.8
Guidance from Colleagues and Friends	50	29.2
Training Courses Offered by College	14	8.2
External Courses	10	5.8
Total	171	100.0

Table V depicts that the most popular method of acquiring the necessary skills to use Internet is via trial and error method. A majority of the respondents (i.e. 56.8%) used this method to learn the Internet, followed by guidance from colleagues and friends with 29.2% responses. 8.2% of the respondents learnt the Internet through training offered by the college and 5.8% through external courses.

**Table VI : Place of Internet and electronic resources access (N=171)**

Variables	Number	%
Home	33	19.3
College or Work Place	121	70.8
Café	17	9.9
Total	171	100.0

Table VI highlights the location from where the Internet and electronic resources are mostly accessed by the dental teachers and students. A majority of the respondents i.e. 70.8% access the Internet from the college or work place, while 19.3% also access from home. Another 9.9% use cyber cafes for accessing the Internet and electronic resources.

**Table VII : Main reason for using the Internet and electronic resources (N=230)**

Variables	Number	%
Research	42	18.3
Health/ Dental Information	98	42.6
Patient Care	61	26.5
Others	29	12.6
Total	230	100.0

The respondents were asked to indicate the main reasons for using the Internet and electronic resources. Table VII shows that 42.6% of the respondents use the Internet and electronic resources for perceiving the health / dental sciences information, followed by patient care with 26.5% responses. 18.3% for patient care and 12.6% for other reasons.

**Table VIII : Use of Internet services and electronic resources (N=171)**

Variables	%	Number
Internet Services		
E-mail	163	95.3
WWW	152	88.9
FAQ	88	51.5
Chat	44	25.7
Internet Telephony	27	15.8
Blog	7	4.1
Electronic Resources		
E-journals	109	63.7
E-books	75	43.6
E-databases	59	34.5
DVD/ CD-ROMs	28	16.3
Other	12	7.0

Table VIII depicts the use of Internet services and electronic resources. E-mail has been chosen as the most popular Internet service and e-journals as the most popular electronic resource with 95.3% and 63.7% responses respectively. The use of Internet services in order of preference is WWW 88.9%, Frequently Asked Questions (FAQs) 51.5%, chat 25.7%, Internet telephony 15.8% and blog 4.1%. Similarly, the use of electronic resources in order of preference is e-books 43.6%, e-databases 34.5%, DVD/CD-ROMs 16.3% and other electronic resources 7%.

**Table IX : Problems faced by the users (N=324)**

Variables	%	Number
Difficulty in finding relevant information	65	20.1
Overload of information on the Internet	119	36.7
Electricity failure	85	26.2
Data authenticity	55	17.0
Total	324	100.0

Table IX depicts the problems faced by the users in surfing. 36.7% of the respondents find overload of redundant information on the Internet. 20.1% find it difficult to get the relevant information from the Internet. 26.2% opinion that they face the problem of electricity failure in the college. 17% of the respondents also reported that data available on the Internet is not much authentic.

**Table X : User= satisfaction with Internet services and electronic resources (N=171)**

Variables	%	Number
Fully	122	71.3
Partially	38	22.2
Least	11	6.5
Total	171	100

Table X shows that majority of the respondents i.e. 71.3% feel fully satisfied with Internet services and electronic resources. 22.2% of the respondents feel partially satisfied and only 6.5% feel least satisfied.

**Table XI : Do you think Internet and electronic resources can replace physical resources? (N=171)**

Variables	%	Number
Yes	34	18.8
No	137	80.2
Total	171	100.0

A majority of the respondents (80.2%) feel that the Internet and electronic resources cannot replace the physical resources (print resources), but only supplements the print resources. Only 18.8% of the respondents feel that Internet and electronic resources can replace print resources because they find it difficult to get the relevant information on the Internet.

Major findings of the survey are:

- A majority of the dental teachers and students (73.7%) under study have their own personal computers or laptops.
- The most popular method of acquiring the necessary skills to use Internet and electronic resources is via trial and error method. A majority of the respondents (i.e. 56.8%) used this method to learn the Internet, followed by guidance from colleagues and friends with 29.2% responses.

- A majority of the respondents (70.8%) access the Internet from the college or workplace, while 19.3% also access from home.
- 42.6% of the respondents use the Internet and electronic resources for finding health/dental sciences information, followed by patient care with 26.5% responses.
- E-mail has been chosen as the most popular Internet service and e-journals as the most popular electronic resource, with 95.3% and 63.7% responses respectively.
- 36.7% of the respondents find overload of redundant information on the Internet is the main difficulty in using the Internet. 20.1% find it difficult to get the relevant information from the Internet.
- A majority of the respondents (71.3%) feel fully satisfied with Internet services and electronic resources.
- A majority of the respondents (80.2%) feel that the Internet and electronic resources cannot replace the physical resources (print resources) that it only supplements the print resources.

## Recommendations

Based on the findings of the study, the following suggestions are put forward to improve the use of the Internet and electronic resources among the dentists in all the dental colleges and hospitals of Punjab state of India:

- The Internet and allied technologies should be included in the curriculum of dental sciences.
- There should be complete campus-wide networking with the Internet browsing facility connecting the dental teachers' rooms as well as hostels.
- Libraries of dental colleges should subscribe more e-journals and e-databases.
- Some orientation training programmes should be organized by the colleges at regular intervals so that the maximum users can improve their excellence or proficiency in the use of the Internet for academic purposes.
- All the academic news should be provided at the college website and it should be regularly updated.
- Information regarding the popular and the latest websites with their addresses should be displayed on the notice board in the computer lab.
- The qualified IT staff should be appointed to provide the expert guidance to users about e-resources and Internet.

## Conclusion

The Internet as medium of communication is useful in medicine, and has become an important means of delivering dental care. The use of the Internet is an evolving phenomenon at this stage. Its use in the dental colleges and hospitals under study is still in a state of infancy or early maturation. We can very well visualize a situation when all users will have achieved near perfection in the use of and full dependency on the Internet for their information needs. So still there is a vast scope of future research in different types of users' behaviour and comparison of users' behaviour towards the Internet.

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#### **Appendix I. List of Dental Colleges & Hospitals of Punjab, India**

Sr. No.	Dental Colleges & Hospitals
1.	Baba Jaswant Singh Dental College & Hospital, Ludhiana
2.	Christan Dental College & Hospital, Ludhiana
3.	Desh Bhagat Dental College & Hospital, Muktsar
4.	Deshmesh Dental College & Research Institute, Faridkot
5.	Genesis Dental College & Research Institute, Ferozepur
6.	Government Dental College & Hospital, Amritsar
7.	Government Dental College & Hospital, Patiala
8.	Guru Nanak Dev Dental College & Hospital, Sunam
9.	Guru Ram Das Dental College & Research Centre, Amritsar
10.	Luxmi Bai Dental College & Hospital, Patiala