

USES OF COMPUTERS AND INTERNET APPLICATIONS BY DENTAL STAFF AT KING SAUD UNIVERSITY COLLEGE OF DENTISTRY

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ABSTRACT

To evaluate the use of computers and internet facilities by the staff in King Saud University- College of Dentistry, to identify the obstacles that prevent the staff from using either the computer and for the internet and to propose solutions for these obstacles.

300 questionnaires were distributed to dental staff in King Saud University, College of Dentistry (Darraiyyah University Campus and Malaz University Campus), the sample included faculty members, post graduate students, general and advanced practitioners and interns, dental secretaries and auxiliaries. The questionnaire consisted of 29 questions distributed over 6 major sections.

Out of 300 questionnaires distributed, 213 were returned (71% response rate). 62.9% of the respondents were males and 37.1% were females. 77.5% were computer users (76.1% of the male sample and 79.7% of the female sample). 71.3% described their computer knowledge as moderate. 46.9% used the computer in the field of dentistry while 53.1% used it for general purposes. The most used internet applications were email 97.0% of the computer users. 81.2% access the internet from home. Finding information over the internet reported to be of moderate difficulty for 50.6%. Of the general internet limitations, slowness of the internet was reported by 58.5%. Limitations of the internet used in the college included not having enough time (42.7%) and limitation of computer facilities to faculty members (38.4%). 47.9% of those who did not use a computer related their problems to time limitation.

Computers were mostly used for general purposes by dental staff. There is no significant difference in using computers between males and females among dental staff. The major limitation for not using the internet was slowness of the internet, time consuming and cost. Time and cost were the major limitations for not using computers.

Index Words: internet, computers, dental internet applications, dental staff Riyadh

INTRODUCTION

In the mid 1980's dental practitioners began to use computers primarily to automate the financial aspects of their practices such as record keeping, insurance processing and billing. This was soon expanded to include patient recalls, patient medical and dental history and treatment tracking. At

that time, little was being done in the area of communications

Nowadays computers have invaded most aspects of the dental practice. The computer provides better ways to collect, assess, manipulate and analyze information. Communication can provide us with new ways of sharing information.¹

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ARPA, the Advanced research Project Agency; and (NASA), National Aeronautic and Space Administration; were formed in late 1958. In 1969, the first ARPANET connections were made connecting four nodes in USA. Further developments took place including emerging of the e mail, domain name system and news groups but these services were not available to the public. By late 1991 World Wide Web (WWW) was released to the public."

Internet was launched for the public in Saudi Arabia in late 1998 from King Abdulaziz City for Science and Technology (KACST), although KACST was hooked up to the Internet since 1992.⁴ Nowadays, there are over 300,000 Internet users in KSA.⁵

The internet is a global information resource of unique scale and scope. It adds a new powerful facility for communicating and accessing current and relevant information that will support patient care.^{6,7}

The most useful internet applications in dentistry include e-mail, patient information, management and communication, medical and pharmacology information, laboratory communication, continuing professional education, referral and consultation, product information and purchasing and dental discussion groups and forums.⁸

In a previous study on the usefulness of the internet for clinical practice, most considered the internet useful for their practice and had increased their internet use for professional reasons over time. The primary reason cited for using the internet was to keep up with developments in general, followed by to answer patient-specific questions and to provide patient education.⁶

Several papers studied the use of the Internet in Saudi Arabia, Al-Zoman et al⁹ measured the utilization of Internet services among dental professional in Riyadh, the study showed that the Internet was widely used. Almas et al¹⁰ showed that there was a very high level of awareness, but under utilization of dental informatics among dental professionals at King Saud University, College of Dentistry, Riyadh. Wyne et al¹¹ studied the use of the Internet by pediatric dentists in Riyadh, he reported that the use of the internet was almost universal among pedodontists with the primary pro-

fessional use of the internet being for continuing education.

The aims and objectives of the present study are to evaluate the use of computers and internet facilities by the staff in King Saud University College of Dentistry, to identify the obstacles that prevent the staff from using either computers and/or the internet and to propose solutions for these obstacles.

MATERIALS AND METHODS

A survey questionnaire was conducted in this study, 300 questionnaires were distributed to dental staff in King Saud University, College of Dentistry (Darraiyah University Campus and Malaz University Campus), the sample included faculty members, post graduate students, general and advanced practitioners and interns, dental secretaries and auxiliaries (radio-graph technician, dental assistant, steri. technician and lab. technician).

The questionnaire produced based on previous questionnaires used in studies accomplished in the same field.^{6,9,12} The questionnaire was reviewed by a biostatistician. The questionnaire consisted of 29 questions distributed over 6 major sections as shown in the Table 1.

A pilot study was conducted. 12 staff members were involved, the members were asked to fill in and write their comments and suggestions about the questionnaire. Those comments and suggestions were used to modify the questionnaire (modifications included: adding of some elements and choices to the answers and corrections of typing errors). The questionnaire was distributed and collected by researchers and some of the department's secretaries. The Data collected was analyzed using Statistical package for Social Sciences (Ver. 10).

RESULTS

300 questionnaires were distributed, 213 were returned (71% response rate).

Demographic Data

62.9% of the respondents were males and 37.1% were females. The age ranged between 23 to 52 with the most respondent age groups were 35-40 (24.4%). 37.1% were Saudis and 62.9% were non-Saudis. The

TABLE 1. QUESTIONS INCLUDED IN THE QUESTIONNAIRE

Section	Questions
<i>Section one</i> Demographic	<ul style="list-style-type: none"> • Gender • Age • Nationality date of joining (KSU-CD) • Specialty • Position
<i>Section two</i> Computer Knowledge	<ul style="list-style-type: none"> • Do you use a computer (PC or MAC)? • How do you rate your computer knowledge? • How did you learn to use a computer? • Do you own a computer /electronic device? • In general, your computer is used for (general, dental) ?
<i>Section three</i> Uses of the Internet	<ul style="list-style-type: none"> • Which internet application's do you use? • You use the Internet mainly for..... • From where do you access the internet? • What type of Internet access you are using? (connection speed) • How many hours do you spend over the Internet? • From the total time you spend over the Internet Dental Internet applications takes?
<i>Section four</i> Internet in Dentistry	<ul style="list-style-type: none"> • What is/ are the useful Dental Internet application in opinion? • If you are looking for dental information on the Internet do you think it is (easy, need help , difficult, rarely finding what you want) • Do you rely on information gathered from Net ? • Have you ever used the Internet to communicate with other Dentist/ Dental center application/s
<i>Section five</i> Limitations	<ul style="list-style-type: none"> • What is/are the problems you face using the internet (in SA) : • About the college (computer and Internet facilities, what is/are the problem's to it? • Do you think there is need for a computer support personnel / assistance effects the use of computer or/and Internet? • In the future, do you think the use of the Internet for dental applications will be (more, the same, less, don't know)?
<i>Section six</i> If you are not using a computer	<ul style="list-style-type: none"> • What is/are the obstacles that prevent you from using a computer? • Do you rely on another person / secretary to do your computer work? • In the future, you will (start using a computer, not use a computer, you don't know).

largest group was Auxiliaries (radiograph technician, dental assistant, steri. technician and lab. technician) (45.1%) followed by the faculty members (24.4%). (Table 2)

Computer Knowledge

77.5% were computer users (100% Faculty members, 94.1% GPs/interns, 90.5% secretaries, 54.2%

auxiliaries and 100% PG) (Fig 1). Computer users were 76.1% of the male sample and 79.7% of the female sample. 46.9% used the computer in the field of dentistry while 53.1% used it for general purposes. 22.5% were not computer users, 89.5% of them were auxiliaries. 12.7% does not own a computer or electronic device. 71.3% described their computer knowledge as moderate (73.26% of the male sample and 68.25% of the

TABLE 2. PERCENTAGE OF RESPONDENTS' AND POSITIONS

Position	No.	Percentage
Auxiliaries*	96	45.1%
Secretaries	21	9.9%
Faculty members	52	24.4%
PG**	10	4.7%
Gp*** / interns	34	16%

(Radiograph technician, dental assistant, steri. technician and lab. technician),

** (Post Graduate),

*** (Graduate Practitioner)

female sample with moderate knowledge $P=0.18$) (53.8% Faculty members, 71.9% GPs/interns, 68.4% secretaries, 88.5% auxiliaries and 80.0% PGs) while 4.3% described their knowledge as low (Fig 2). 87.3% taught themselves to use computers by self education while only 15.8% learned by using lectures and courses.

Use of the Internet

This study showed that the most used internet applications were email 97.0% of the computer users, (98.0% of the male sample and 95.2% of the female sample), followed by reading online journals 58.2%, (60.8% of the male sample and 54.0% of the female sample). 81.2% access the internet from home. (82.4% of the male sample and 79.4% of the female sample) while only 37.6% accessed the internet using the college facilities (33.3% of the male sample and 44.4% of the female sample). 63.6% of the respondents surfed the internet less than seven hours weekly (56.9% of the male sample and 74.6% of the female sample), 42.9%

spent less than 10% of their total time over the internet accessing dental internet applications. (39.6% of the male sample and 48.4% of the female sample).

Internet and Dentistry

Internet served the dental professionals in many aspects, 68.1% reported that the most useful internet applications in dentistry were e-mail, followed by continuous education courses (47.9%) and medical and pharmacological databases (39.3%). The least useful application was laboratory communications (16.0%). Finding information over the internet reported to be of moderate difficulty for (50.6%), easy for 40.7%, and difficult for 8.6%. 23.8% reported using the inter-net to communicate with other dentists or dental centers.

Limitations of Computers and Internet Usage

Of the general internet limitations, slowness of the internet was reported by (58.5%), time consuming by (40.9%), high cost by (38.4%) and difficulty in accessing the internet (28.7%). Limitations of the internet used in the college included not having enough time (42.7%), limitation of the computer facilities to faculty members (38.4%), slowness of the internet (26.8%), few office internet lines (19.4%), and no. of available equipments (17.7%), while quality of the equipments was reported to be a problem by 9.8%. 56.4% agreed that there is a need for a computer support personnel or assistant in the college. 94.5% thought there would be more use of the internet for dental applications in the future. 47.9% of those who did not use a computer related their problems to time limitation and 41.7% related to cost. 83.3% of them plan to use a computer in the future.

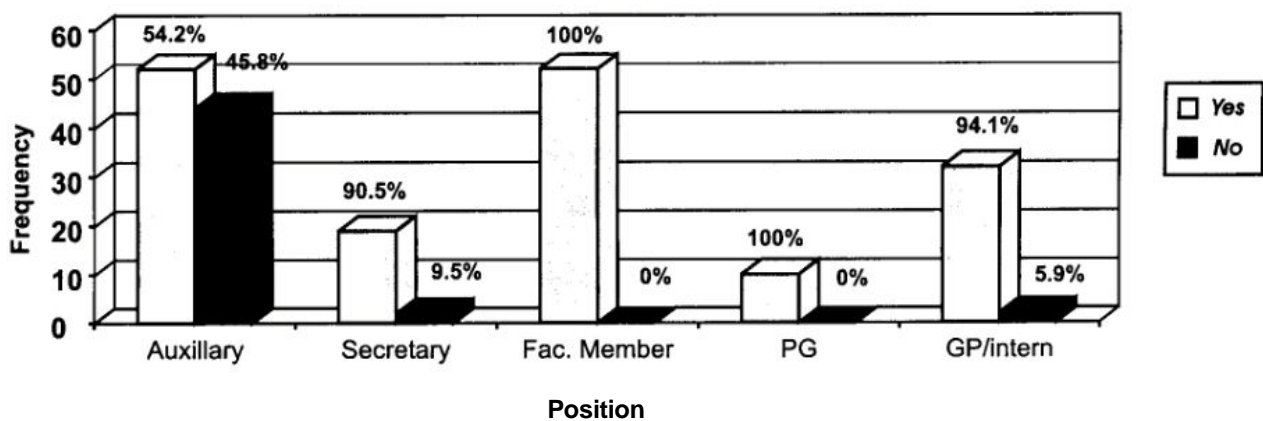


Fig 1. Computer usage among dental staff

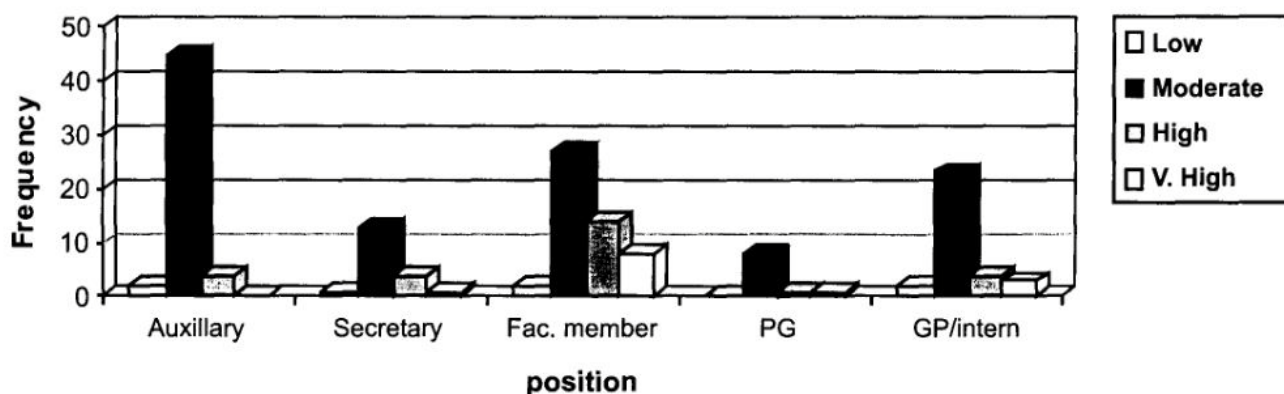


Fig 2. Computer knowledge among dental staff

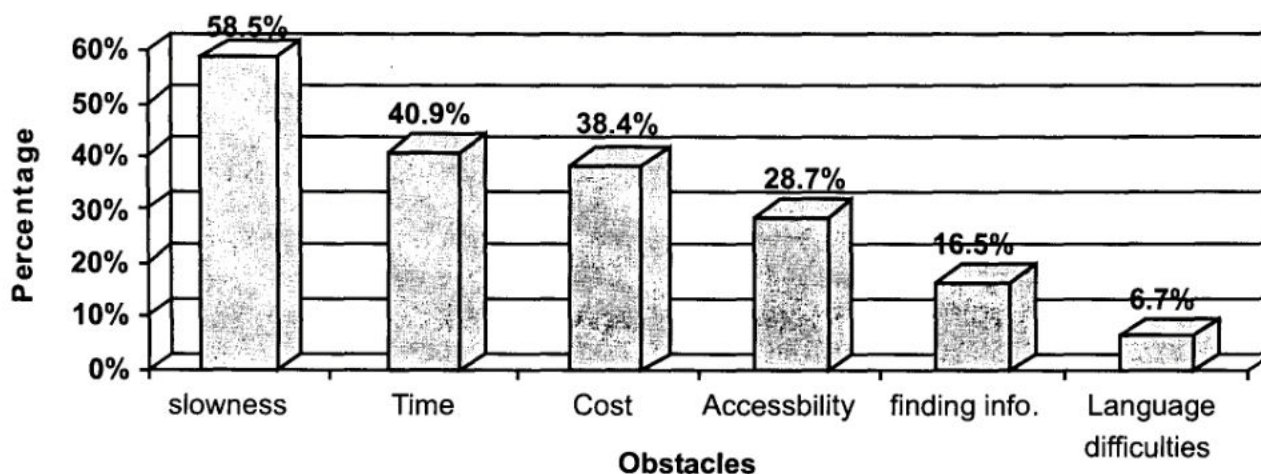


Fig 3 Limitations of using internet in general

DISCUSSION

This study showed that 77.5% of dental staff used computers. The computer users were 76.1% of the male sample and 79.7% of the female sample, by using chi-square statistical analysis it showed no significant difference between males and females based on gender ($P=0.54$). There is no report in the literature on computer usage by dental staff in KSU; previous study reported that the computer owners among dental professionals were 76.9% in different health sectors in Riyadh city⁹. Almas et al¹⁰ in a study at KSU College of Dentistry, Riyadh, reported that 63.3% described their computer knowledge as low, while this study reported 4.3%. Majority of the sample in this study (71.3%) reported their computer knowledge as moderate (73.26% of the male sample and 68.25% of the female sample) by

using chi-square statistical analysis it showed no significant difference between males and females based on gender ($P=0.18$). This difference in computer knowledge between the two studies might be due to the type of sample (Almas included students in his sample while in this study students were not included). Further research is recommended to evaluate the student's computer knowledge. Al-Zoman et al⁹ studied the internet usage among dental professionals in Riyadh, they reported that 69.2% learned computers by themselves and 12.5% through lectures or seminars. This is an agreement with this study which reported that 87.3% learned by self education and 15.8% learned by lectures and courses.

This study showed that the most used internet application was the e-mail (97.0%). This finding agreed

with Al-Zoman et al^o who reported 84.9% and the findings of an international study done by Titus K.L et al¹² who reported that 98.6% were e-mail users among 825 dental professionals from 52 countries (64% of the sample from USA and Canada). Our findings disagree with Almas et al^o who reported that 15.0% of the college of dentistry sample were e-mail users. Most of the respondents in this study access the internet from home (81.2%). This agrees with Al-Zoman et al^o who reported that 80.2% access the internet from home. This study reported that 37.6% access the internet from the college.

This study reported that e-mail was the most useful internet application in dentistry (68.1%) followed by continuous education courses (47.9%). This is in partial agreement with what has been reported by Wyne et al¹¹, in a survey of internet usage among pediatric dentists in Riyadh, Saudi Arabia. They stated that two thirds of the respondents utilized the internet for professional continuing education. This study reported that finding information on internet was easy for 40.7% while, Titus et al¹² reported that 69% of dental professionals found it very easy or easy to find information on the internet. This variation might be due to the new arrival of internet in KSA (late 1998) and different level of computer education and knowledge between the two samples. 58.5% considered slowness of the internet in general as the major problem. This agrees with Al-Zoman et al^o who reported (57.7%). Not having enough time was a major problem in this study (42.7%) and Al-Zoman et al^o study (58.8%). Similar findings were reported in the area of internet accessing problems by this study (28.7%) and Al-Zoman et al⁹ (32%). 56.4% supported that the availability of a computer support personnel affects the usage of computer and or internet. This points out that there is a need for computer support personnel which might lead to increasing internet and computer usage.

(22.5%) were not computer users. The reasons behind not using a computer in this study were time limitation (47.9%) followed by cost factor (41.7%). This might be due to the fact that most of the non-computer users (89.5%) were auxiliaries (radiograph technician, dental assistant, steri technician and lab technician).

Solutions for computer and internet usage problems might include, continuous educational courses, computer knowledge update, increasing number of computer facilities available for dental staff, increasing

the number of computer supporting personnel, improving the quality of internet connections, and lowering the internet cost. Such solutions would enhance computer and internet usage among dental staff.

CONCLUSION

Within the limitation of this study we can conclude that:

- Computers were mostly used for general purposes by dental staff.
- The learning of computer skills was accomplished by self-education by most dental staff.
- There is no significant difference in using computers between males and females among dental staff.
- There is no significant difference with computer knowledge between males and females among dental staff.
- The major limitation for not using the internet was slowness of the internet, time consuming and cost.
- Time and cost were the major limitations for not using computer.

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