ORIGINAL ARTICLE

A Al-Wahadni Z Elnasser M Azab AI Owais Learning priorities and attitudes towards computer-assisted learning of general medical practitioners, general dental practitioners and dental hygienists

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Abstract: Objectives: The objectives of this survey were to assess the attitudes and learning priorities of general medical practitioners (GMPs), general dental practitioners (GDPs), and dental hygienists (DHs) working at Jordan University of Science and Technology (JUST), Irbid, Jordan in relation to post-graduate education, to gather information on their attitudes and skills in using computers and computerassisted learning (CAL) and to see whether the material in this form is acceptable to participate as a means of teaching. Methods: Data for this study was gathered via a questionnaire distributed to 63 health professionals including GMPs, general dental practitioners and DHs (mean age 24.79 ± 2.69 years) working at JUST. Results: Of the 63 participants, 80% of the participants have home computers, 38% have office computers at work and only 25% have both home and office computers. Approximately 53% of the participants had their first CAL experience at home. Seventythree of the participants indicated that connection to Internet is necessary for their work. Seventy-one of the participants were interested in the possibility of using CAL to further improve and increase their medical knowledge. The most important topic for doctors was 'learning about new techniques which may supersede those in current use', for DHs it was 'improve knowledge or skill in radiology', and for dentists it was 'reinforcement of well established techniques commonly used in dental practice'. Conclusions: It is necessary for practicing health care professionals to update

themselves by taking continuous education courses after graduation more conveniently via CAL methods.

Key words: learning priorities; attitudes; computer-assisted learning (CAL); general medical practitioners (GMPs); general dental practitioners (GDPs); dental hygienists (DHs); auestionnaire

Introduction

It has long been recognized that it is essential for established practitioners to regularly update the entry-level professional knowledge through continuing education. It is in the best interest of patients to be treated by practitioners who are fully informed about the most current thinking on the treatments they provided. The ability to recognize conditions, which require referral to specialist colleagues, needs to be renewed. This continuing education is provided in the form of postgraduate continuing education courses and lectures organized under the auspices of professional associations and universities. Smith, Whitehorn and McCormick (1) examined the general practitioners perception of continuing education in New Zeeland, they reported that all participants acknowledged that continuing medical education is a life-long process essential for general medical practitioners (GMPs).

The content of such approved courses and lectures is largely determined by the associations/universities and often influenced by the range of experts available locally. However, the content is rarely determined by the needs of the practitioners themselves.

Several factors may limit the benefit of attending these courses, most importantly is the place of residence or work. It is difficult for general practitioners who live in remote areas to attend courses offered in another city.

However, the advent of computers and computer-assisted learning (CAL) methods could make it easier to participate in courses through Internet sites or using an educational CD at home/work.

The recent years witness wide development in medical practice and the computer becomes an important device used in all medical practices. Time is saved by doing differential diagnosis which provides photographs to assist understanding the case and also helps educate patients. It is important for all GMPs, general dental practitioners (GDPs) and dental hygienists (DHs) to update themselves by taking additional courses after graduation via CAL methods. Additional courses make practitioners more confident, being updated with recent advances and developments, and reinforcing methods of care for their patients and themselves.

Computer-assisted learning can supplement and reinforce learning that is more traditional and provide the opportunity to simulate clinical situations in a problem-based manner and has the potential to develop skills as well as knowledge. CAL learning is easier than conventional methods, because users have the ability to choose the relevant parts of the package according to their needs.

This study aims to understand the needs of the graduate to update his/her knowledge in the professions of medicine, dentistry and dental hygiene and to evaluate their knowledge and skills in using computer as well as to examine the attitude towards CAL. Therefore, the following research questions were addressed:

1. What priority would the health professionals give if they were designing a post-graduate course?

- 2. What is the participants experience using computers?
- 3. What are the main uses for the participants' computers?

4. What are the participants experience and views towards computer-assisted learning?

Study population and methodology

A questionnaire of two pages was distributed to a total of 63 GMPs, GDPs, and DHs (mean age 24.79 \pm 2.69 years) working at Jordan University of Science and Technology. This convenient sample was examined due to having three different professional groups working in the same place and under the same conditions. The questionnaire assessed demographic variables such as age and gender. It also asked about the respondent's attitudes to post-graduate education courses, such as knowledge about new development in basic sciences, advances in biomaterial sciences, skills in radiology, four-handed medicine/ dentistry, infection control practices, medicolegal/dentolegal aspects of medical/dental practice, skills in diagnosis, behaviour sciences and learning how to revise techniques used in current practices. The respondents were presented with a list of topics and asked to rate each topic on importance to

post-graduate medical and dental education on a Likert fivepoint scale.

Participants were asked about details of their work and home computers. They were also asked whether they had any previous experience of CAL. The participants completed the questionnaire over a period of 1 week. It took about 10 min to be completed by the majority of the participants (see Appendix for questionnaire). Collected data were coded and analysed. Analysis of the data included simple descriptive statistics in the form of percentages and frequency distributions.

Results

Demographic variables

The data were collected in 1 week, and there were 63 respondents to the survey who agreed to participate in the survey. Thirty-three (52.4%) of the participants were males and 30 (47.6%) were females. The mean age of the participants was 24.79 years (SD 2.69). There were 25 (39.7%) doctors, 20 (31.7%) dentists and 18 (28.6%) DHs.

Ranked importance of post-graduate education topics

The second part of the post-graduate education section asked participants to grade a number of items on a standard Likert five-point scale, indicating their priority for post-graduate education from very important (1) to very unimportant (5). Overall, the participants indicated that 'learning about new techniques which may supersede those in current use' is the most important topic; however, the knowledge of behaviour science was ranked as least important topic. The results are shown in Table 1.

The 25 participating doctors indicated that the 'learning about new techniques which may supersede those in current use' is the most important topic and 'cross-infection control' is

Learning how to make the best use of hospital laboratory services

Knowledge of behaviour sciences

Discussion of medicolegal/dentolegal aspects of medical/dental practice

Reinforcement of well established techniques commonly used in medical practice

Post-graduate education topics Number Mean (SD) 63 Learning about new techniques which may supersede those in current use 1.34 (0.71) 63 1.38 (0.72) Improving skill in diagnosis and management Improve knowledge or skill in radiology 63 1.56 (0.74) 63 Reinforcement of four-handed medicine/dentistry 1.75 (0.76) 63 1.85 (0.77) Knowledge about new development in basic science, such as molecular biology Knowledge about advances in biomaterials sciences and their application for medical/dental practice 63 1.89 (0.79) 63 1.99 (0.79) Learning about current practice in cross infection control Improving practice management skills 63 2.12 (0.82)

Table 1. Ranked importance of post-graduate topics

Table 2. The main uses for nome and work computers	Table 2	. The main	uses for	home and	work	computers
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The main uses for home and work computers	Number	Mean (SD)	Rank
E-mails	63	1.36 (0.72)	1
Word processing	63	1.62 (0.74)	2
Education	63	1.79 (0.78)	3
Presentation	63	2.21 (0.84)	4
Practice management	63	2.65 (0.81)	5
Book keeping	63	2.96 (0.99)	6
Statistics	63	3.21 (1.02)	7
Games	63	4.54 (1.48)	8

the least important. The 20 participating DHs indicated that 'improve knowledge or skill in radiology' is the most important and 'reinforcement of four-handed dental and medical skills' is the least important. The 18 participating dentists indicated 'reinforcement of well established techniques commonly used in dental practice' is the most important and 'improve knowledge or skill in radiology' is the least important.

The main use for computer at home and at work

Participants were asked to grade each of the eight items on a standard Likert five-point scale indicating their priority for post-graduate education from 'very important (1)' to 'very unimportant (5)' (Table 2).

E-mail use was rated significantly more important than other uses. Doctors and dentists indicated that e-mails are the main use, whereas 'games' are the least important use. On the contrary, DHs indicated that 'book keeping' is the most important use and 'statistics' are the least important.

Attitude and experience of CAL

Participants were asked if they have an experience in CAL and if they do, where was first experience was. Location of the participants experience is shown in Table 3. Three

63

63

63

63

2.84 (0.83)

3.41 (1.02)

3.89 (1.13)

4.34 (1.21)

Rank

1

2

3

4

5

6

7

8

9 10

11

12

Table 3. Locations of the first experience in CAL

Locations of the first experience in CAL	Number	Per cent
Conference	11	17.5
Lecture (JUST)	8	12.7
Laboratory (JUST)	6	9.5
Home	33	52.4
Others	2	3.2
Never had experience	3	4.8
Total	63	100.0

participants indicated they had no experience with CAL, while 60 of them did have experience; 52.4% of the participants indicated that their experience with CAL was at home, and 9.5% of them use laboratory computers.

Computer-assisted learning

This was the last part of the questionnaire and included questions or statement about CAL ranging from 'strongly agree (1)' to 'strongly disagree (5)'. The results are shown in Table 4.

Forty participant (63%) were confident when using a computer. Forty-one (65%) participants found computers are well to get them to do what they want to do. Forty participants (63%) found computers easy to use. Forty-three per cent indicated that CAL has been useful. Seventy-one per cent indicated they would be interested in the possibility of using CAL to further enhance their medical/dental knowledge (Table 4).

Discussion

The aim of this study was to examine whether GMPs/GDPs and DHs are interested in post-graduate courses and to rank desired post-graduate courses according to their importance. We also evaluated any differences between the attitudes of those who had some knowledge of computing and those who did not in the usefulness and ease of CAL materials.

There are practitioners who feel their needs are not met by the existing continuing education programmes. In continuing education courses, it is necessary to identify the needs of the

Table 4.	Attitudes	towards	computer	-assisted	learning
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target audience. Having identified these needs, a programme can be tailored to them. Results indicate that 'learning how to make techniques which may supersede those in current use' is the most important course. Medicine, dentistry and allied dental sciences evolve rapidly. Every day a new technique or material introduced to the market. Severe competition among clinicians to attract patients and/or gain jobs makes them look forwards to improving and updating their theoretical and practical knowledge.

Knowledge of behaviour sciences was ranked the least important. One may attend courses that are not practical and does not affect their technical skill directly. DHs indicated that 'improve knowledge or skills in radiology' is the most important, whereas 'reinforcement four-handed medical and dental skills' is the least important. This result may be explained by the fact that DHs as part of their job and duties depend on the importance of skills in radiology, while the reinforcement of four-handed skills the least important, because it is not the usual and more practiced way of work in dentistry and medicine in Jordan.

However, GDPs indicated 'reinforcement of well established techniques commonly used in dental practice' is the most important course to develop and update their work in all aspects of medical practice. Whereas 'improve knowledge or skills in radiology' is the least important because GDPs do not consider X-rays a fundamental part of their training as they are more attracted to treat patients. Their emphasis would be improving their skills, which may reflect the need to increase the time of hands-on training during the bachelor.

Computers and CAL results indicated that using of computers at home was more popular than work, because computers are unavailable in many workplaces and many of these computers are not connected to the Internet. They are also too busy at work to use computers. Similar results were supported by Dørup (2) with 71.7% of the respondents indicating they had access to a computer at home.

In the present study, 65% found computers beneficial in their jobs. A higher figure was reported by Asgari-Jirhandeh &

Attitudes towards CAL	Strongly disagree (%)	Disagree (%)	Neither agree or disagree (%)	Agree (%)	Strongly agree (%)
I feel confident when using computer	5 (7.9)	8 (12.7)	10 (15.8)	31 (49.2)	9 (14.2)
I find computer sufficiently well to get them to do what they want them to do	1 (1.6)	6 (9.5)	15 (23.8)	21 (33.3)	20 (31.7)
I find computer easy to use	3 (4.8)	12 (19.0)	8 (12.7)	20 (31.7)	20 (31.7)
In my experience CAL has been useful	4 (6.3)	19 (30.2)	13 (20.6)	15 (23.8)	12 (19.0)
I would be interested in the possibility of using CAL to further medical/dental knowledge	2 (3.2)	4 (6.3)	12 (19.0)	25 (39.7)	20 (31.7)

The results showed that the main use of computer at home and at work was for exchanging e-mails, because e-mail is a fast and convenient way to exchange information. These results confirmed those reported by Asgari-Jirhandeh & Haywood (3) who found that the most frequent application used was e-mail when they surveyed the computer awareness among medical students at the University of Edinburgh. E-mailing and Internet are the most commonly used features of the PC after text documentation as found by Peroz *et al.* (4). Dørup (2) showed that 90% of his sample used e-mail regularly. Whereas they indicated that 'games' are the least use because they are not necessary for professionals who are normally too busy or that available games were not interesting.

Dental hygienists indicated that 'book keeping' is the most important use because this is an important part of their job. However, they indicated that 'statistics' are the least important thing because they do not normally use it at work.

The call for medical students to become literate in the uses of information technology has become a familiar refrain. Over 10 years ago, the Association of American Medical College's Report recommended that medical schools incorporate into their curricula training in the use of such technology; however, Koshman (5) showed that in the intervening decade a little progress has been made towards meeting this goal, even though the need for such changes has grown more compelling. There is no doubt of the benefit of CAL as this would make access to information easier and quicker which refresh and update the required knowledge. However, the success of CAL depends on the basic computer skills, availability of a computer and the content of the CAL courses. Though several studies (1, 2, 5) were carried out in the developed countries, none, to the best of our knowledge, were carried out in the developing countries. Previous studies did not compare the attitude towards CAL among the three interrelated professions. The purpose of this project was to understand the needs of the graduate to update his/her knowledge in the professions of medicine, dentistry and dental hygiene.

We recommend the difference in attitude towards CAL be examined between the developed and developing countries and to study the effect of socioeconomic status of the subject towards knowledge on computer and their attitude towards CAL.

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References

- Smith G, Whitehorn M, McCormick R. General practitioners' perception of continuing medical education's role in changing behavior. *Educ Health* 2003; 16: 328–338.
- 2 Dørup J. Experience and attitude towards information technology among first-year medical students in Denmark: longitudinal questionnaire survey. *J Med Internet Res* 2004; **6**: 1017.
- 3 Asgari-Jirhandeh N, Haywood J. Computer awareness among medical students: a survey. *Med Educ* 1997; 31: 225–234.
- 4 Perozl I, Bosel C, Lange KP. Representative survey of dental students about the present sate of education, PC equipment and configuration requirements for a net-based dental education system. *Med Teach* 2003; **25**: 385–390.
- 5 Koschmann T. Medical education and computer literacy: learning about, through, and with computers. Acad Med 1995; 70: 818–821.

Appendix. The Computer Assisted Learning Questionnaire.

CAL Questionnaire

- 1. Are you: Male□ Female□
- 2. How old are you?years
- 3. Are you a \square GMP \square GDP \square DH

What priority would you give the following items if you were designing a post-graduate course? Please indicate your choice by circling ONE response:

- 1. If you feel that the topic is VERY IMPORTANT (VI) to the students.
- 2. If you feel that topic is IMPORTANT (I) to the students.
- 3. If you feel that topic is NEITHER IMPORTANT NOR UNIMPORTANT (N) to the students.
- 4. If you feel that topic is UNIMPORTANT (U) to the students.
- 5. If you feel that topic is VERY UNIMPORTANT (VU) to the student.

		VI	I	Ν	U	VU
*	Knowledge about new development in basic sciences, such us molecular biology	1	2	3	4	5
*	Knowledge about advances in biomaterials sciences and their implication for medicine and dentistry	1	2	3	4	5
*	Reinforcement of well-established techniques commonly used in dental and medical practice	1	2	3	4	5
*	Learning how to make the best use of hospital laboratory services	1	2	3	4	5
*	Learning how to make techniques, which may supersede those in current use	1	2	3	4	5
*	Knowledge of behavioural sciences	1	2	3	4	5
*	Improving skills in diagnosis and management	1	2	3	4	5
*	Discussion of medicolegal aspects of medical practice	1	2	3	4	5
*	Improving practice management skills	1	2	3	4	5
*	Learning about current practices in cross-infection control	1	2	3	4	5
*	Reinforcement of four-handed dental and medical skills	1	2	3	4	5
*	Improve knowledge or skill in radiology	1	2	3	4	5

Your experience and use of computer (Please do not include home games consoles in your answers.)

*	Do you have a computer at your home?	Yes⊡	No□
*	Do you have a computer at your work?	Yes□	No□
*	Did you connect your computer to the Internet?	Yes	No□
*	Do you have an access to the Internet in the clinics?	Yes	No□
*	Do you think access to the Internet in the clinic is necessary?	Yes□	No□

What are the main uses for your home and/or work computer? (Please indicate your choice by circling one response only.)

Main use	VI	I	Ν	U	UN
Book keeping	1	2	3	4	5
Word processing	1	2	3	4	5
Education	1	2	3	4	5
Games	1	2	3	4	5
Practice management	1	2	3	4	5
E-mails	1	2	3	4	5
Statistics	1	2	3	4	5
Presentation	1	2	3	4	5

Your experience and views about computer-assisted learning: *Have you ever experienced any form of computer-based learning? Yes No *If yes, where did you first experience computer-based learning?

* Conference C * Lecture (JUST)* C * Laboratory (JUST)* C * Home C			
* Lecture (JUST)* Laboratory (JUST)* * Home	*	Conference	
* Laboratory (JUST)* [* Home]	*	Lecture (JUST)*	
* Home	*	Laboratory (JUST)*	
	*	Home	

Other..... Specify

How well would you agree with the following statements? (Please circle one response only.)

1	To indicate that you STRONGLY AGREE (SA) with the statement
2	To indicate that you AGREE (A) with the statement
3	To indicate that you NEITHER AGREE NOR DISAGREE (N) with the statement
4	To indicate that you DISAGREE (D) with the statement
5	To indicate that you STRONGLY DISAGREE (SD) with the statement

		SA	А	Ν	D	SD
*	I feel confident when using computer	1	2	3	4	5
*	I find computer sufficiently well to get them to do what I want them to	1	2	3	4	5
*	I find computers easy to use	1	2	3	4	5
*	In my experience, computer-based learning has been useful	1	2	3	4	5
*	I would be interested in the possibility of using computer-based learning to further my dental knowledge	1	2	3	4	5
*	The Medical school (JUST) offers access to computer-based learning	1	2	3	4	5
*	The applied Medical Science School offers access to computer-based learning	1	2	3	4	5

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