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A study of utilization and proficiency in using online bibliographic databases among students and faculty of the College of Medicine in Al Ahsa, King Faisal University

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Abstract. Context: Medical informatics education is becoming increasingly relevant for maintaining the quality of health care. There are few studies that have addressed the utilization and proficiency of using online bibliographic databases among medical faculty and students in the Kingdom of Saudi Arabia (KSA).

Aims: To assess the pattern of use, proficiency and training needs related to online bibliographic databases among both medical students and faculty at College of Medicine, under King Faisal University, Al Ahsa.

Methods and Material: A cross-sectional survey study targeted all teaching faculty and medical students from third year onwards. Response rate was 69.9% (236/376) among medical students and 84.6% (66/78) for the faculty

Results: Eighty six percent of faculty and 71.1 % of students had used online databases in the previous year. Frequency of use for literature searching among faculty was 6-10 times /year in 23.1%, > 10 times/year in 53.8%.For students 38.9% had used online databases 1-5 times in the last year and 18.6% used it 5-10 times in the previous year.

Conclusions: In spite of easy access to the online databases, the proficiency of use is low among medical students in our institution. Both students and faculty need training for optimum use of online databases.

Keywords. Electronic bibliographic databases, Literature searching, PubMed, Medical students.

Introduction

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

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practices and update knowledge. [1, 2] Online Bibliographic Databases (OBD) is useful resources for medical professions to find relevant data and information. [3] One of the major goals of medical education is to encourage students to maintain their knowledge by becoming life-long learners. Adequate skills in information seeking and regular use of original scientific sources are key elements in this process. Medical informatics education, both information processing and technology have been considered to be increasingly relevant for maintaining the quality of health care [4]. To the best of our knowledge there are no previous study that has tackled the utilization and proficiency in using online bibliographic databases among medical faculty and students in the Kingdom of Saudi Arabia (KSA).

The objective of this study was to assess the pattern of use, proficiency and training needs related to online bibliographic databases among both medical students and faculty at College of Medicine, under King Faisal University, Al Ahsa.

1. Participants and methods

1.1 Setting:

This was carried out at College of Medicine, King Faisal University in Al Ahsa, which is located in Eastern Province of Saudi Arabia. The college of medicine was established in 2003, with an undergraduate medical program for male students. Female students were enrolled since 2005.The College adopts traditional form of teaching in the major part of the courses delivered and English language is the primary medium of instruction. The program is divided into pre-clinical; including the first three years and 1st semester of the 4th year, and a clinical stage with different rotations afterwards. The total number of students enrolled at the time of the study amounted to 752 (247 were females, only up to 4th year), while the teaching faculty accounted to 87, ranging from demonstrators to professors.

1.2 Method:

A cross-sectional survey study targeted all teaching faculty and medical students from third year onwards, enrolled at the College of Medicine. The rationale behind exclusion of the first year students was that they were not affiliated to the college as such, while the second year students had not yet received any formal training on literature searching, which provides the basic steps for online database searching, including introduction to PubMed. Data collection was conducted using a self-administered anonymous questionnaire which was designed with adoption of elements form available literature [5, 6] to assess the frequency of utilization and proficiency in using online bibliographic databases among similar population. The data collection form was pre-tested on a sample of second year students to ensure clarity, readability and reliability. The questionnaire was designed to gather information regarding the following parameters:

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1.3 Personal data:

Including age, year of enrollment and current job title for the faculty and their access to online bibliographic databases (home, office, library and others).

1.4 Online literature search assessment:

Details regarding the use of bibliographic databases in the previous year, reasons of not using the bibliographic databases, frequency of use, types of articles and material searched for, the frequency of using PubMed, Medscape, PsycINFO, CINAHL, MDConsult and other relevant online databases. Inquires about relevant resources for searching other than the above mentioned databases including different search engines, books, and others was also added.

1.5 Proficiency:

Self rating proficiency, training received and interest in receiving future training. Medical faculty and students received a proper orientation regarding the objectives and contents of the data collection form, accompanied with a cover letter emphasizing the confidentiality and right of non participation. Data confidentiality was maintained all through the study.

1.6 Data analysis:

Data was entered and processed using SPSS version 16 (SPSS inc. Chicago, IL, USA). For categorical data: frequency, proportions and percentages were used for expression, while for continuous data: median, mean and standard deviation were used for reporting. Response rate was 69.9% (236/376) among medical students and 84.6% (66/78) for the faculty.

2. Results

2.1 General characteristics of the study group:

Table 1 depicts the characteristics of the faculty and medical students, who responded to the survey, in relation to gender and year of enrollment. All students and faculty had access to internet at the college. Students had relatively better access to internet at home compared to faculty (81.0% vs. 42.2%).

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2.2 Frequency of OBD utilization:

Table 2 shows frequency and reasons for OBD utilization, and self rated proficiency among participants. Eighty six percent of faculty and 71.1 % of students have used online bibliographic databases in the previous year, the frequency of use for literature searching among faculty was 6-10 times /year in 23.1%, > 10 times/year in 53.8%, while for students 38.9% have used online databases 1-5 times in the last year and 18.6% used it 5-10 times in the previous year .Only 13 % of the included medical students have used the online bibliographic databases for than 10 times during the last year. The most frequently stated reason for online bibliographic searching among faculty was review articles, evidence-based practice and epidemiology. Among students epidemiology, assignments and other projects were the main reason. About 51% of the faculty stated that they were somewhat proficient in using the online bibliographic databases, and 65.0% were interested to receive further training. Among students, 35.3% stated that they are not very efficient in literature searching using online databases, and 11.6% rated themselves as not at all proficient.

2.3 Training needs:

Table 3 demonstrates the training needs and their interest in training for OBD among participants. Lack of training was the main reason for not using the online bibliographic databases as stated by both faculty and students, followed by previous unsatisfactory results. Of students 85.9% were interested in receiving training to use the online bibliographic databases, while 84.8% of the faculty stated their interest in receiving training.

2.4 Frequency of use of specific databases:

Table 4 Displays the stated frequency of using various OBD among participants. PubMed, Medscape and MDconsult were most frequently used databases used by faculty, while PubMed, and MDconsult were mentioned by students. The frequency of using PubMed bibliographic database demonstrates an upward trend in relation to the year of enrollment of medical students; those at the clinical stage are frequently encountered to this database. Other electronically non medical databases like Wikipedia, search engines like Google, and directory like Yahoo were mentioned to be used by students.

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3. Discussion

Medical learning resources on the internet have been improving and increasing exponentially over the last decade in terms of quantity, quality as well as accessibility. However the question of whether these resources are really being utilized in an optimum manner is debatable. This applies to both medical students as well as to the teaching faculty. The first step to ensure optimum utilization of web resources in any center is to study the present ground situation, followed by a needs analysis and further intervention. Our study based in a college of Medicine covered both medical students and faculty and is mainly for studying the present situation with regards to the utilization of OBDs.

There could be various factors affecting the utilization of OBDs in the context of medical education. This would include:

1) Availability of resources and ease of access including hardware and internet connectivity.
2) Training in use of resources and awareness of updated resources.
3) Level of study (in the case of medical students).

It is understandable therefore that utilization of internet resources would be more in developed countries having better infrastructure, as compared to developing countries. In a large study from Africa in 2007, in four African teaching hospitals (in Cameroon, Nigeria, Tanzania and Uganda and one externally funded research institution in The Gambia), 70% of 305 postgraduate doctors reported textbooks as their main source of information; only 66% had used the Internet for health information in the previous week. Across all 333 respondents, 90% had heard of PubMed, 78% of BMJ on line, 49% the Cochrane Library, 47% HINARI, and 19% BioMed Central. [(7)] Another cross-sectional study from Tanzania by Samuel et al, also found a low level of ability to use ICT facilities among medical students in a leading university in sub-Saharan Africa.[(8)] Another study from Nigeria also highlighted a relatively low use of internet resources among medical students. A majority of the students in this particular study felt that training in computers should be an essential part of their course. Lack of access to hardware was mentioned as the main cause for poor utilization of internet resources. [(9)] Compared to this a study from Denmark (conducted from 1998 to 2002) among first year medical students showed that, 71.7% of the respondents (total respondents = 1159) indicated that they had access to a computer at home, a number that did not change significantly during the study period. Over time, the power of students' computers and the use of e-mail and Internet increased significantly. Towards the end of the study period in 2002, approximately 90% of students used e-mail regularly, 80 % used the Internet regularly, and 60 % had access to the Internet from home. [(10)] A similar high level of internet usage was found in a study among undergraduate dental students in Finland. [(11)] In our study, while access and availability were not a major issue, utilization among students was still low. Lack of adequate training was the most

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cited cause for low utilization. PubMed and MDconsult were the most popular databases used in our respondents. This was expected as PubMed continues to be the most popular medical database used worldwide. [12]

A study on bibliographic resource utilization conducted by the Library of health sciences in Illinois, Chicago concluded that most users (Total respondents were 188) preferred online resources to print, and many choose to access these online resources remotely. Convenience and full-text availability appear to play roles in selecting online resources. The findings of this study suggest that databases without links to full text and online journal collections without links from bibliographic databases will have lower use. These findings have major implications for collection development, promotion of library resources, and end-user training. This suggestions that as computer infrastructure improves, proper training can definitely encourage effective use of OBDs, and in the course of time make them more popular than text books or printed material. [13] A study by Childs et al on barriers to e-learning also highlighted the important role that college libraries and librarians can play to promote e-learning initiatives. [14]

A more recent study from Finland which included specific intervention to improve the use of internet resources concluded that Information-searching skills are correlated with the use of electronic resources, but the level of basic PC skills plays not a major role in using these resources. The student data shows that adequate training in information-searching skills will increase the use of electronic information resources. This study was conducted among undergraduate medical and dental students. [6]Another interesting study from the United Kingdom by Bond et al showed that there indeed were good online guides available, but that, perversely, the better guides tended to require the best searching skills to locate them. [15]

However one Cochrane review which analyzed ten studies (including nine randomized control trials) found that specific strategic interventions to promote adoption of Information and communication technologies (ICTs) by health care professionals did not produce clear cut results. The authors of this review concluded that there was very limited evidence on effective interventions promoting the adoption of ICTs by healthcare professionals. The effectiveness of interventions to promote ICT adoption in healthcare settings remains uncertain, and better designed trials are needed. [16]

4. Suggestions for the future

1) Make training in OBD use an essential part of undergraduate teaching, with yearly refresher courses/seminars for both students and faculty.

2) Use the college library as a nodal point for training and use of OBDs

3) Ensure access to as many journals /e-books as possible

4) Ensure use of up-to-date software and hardware with regular auditing.

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5. Limitations

The study was essentially a cross sectional survey. There was no use or evaluation of interventions to improve the use of OBDs. The job profile of the faculty would be expected to influence their preferences and proficiencies with regard to the use of OBD. This was not taken into account in our study. The proficiency of use was based on a subjective self-assessment.

6. Conclusion

In spite of easy access and availability of the online bibliographic databases, the proficiency of use is low, among medical students in our institution. This is in-spite of a good number of the respondents having good exposure to the use of the internet. Pubmed was the most used electronic resource by both faculty and students. A positive point emerging from the study is that the respondents understand the need to train themselves better in utilizing e-resources and this would definitely help any intervention to improve the proficiency in using online databases for education and research. Both students and faculty are in need for training regarding optimum use of online bibliographic databases. Training in online bibliographic databases search should be an integral part of medical undergraduate curriculum for e ensuring better life-long learning and patient care skills.

Table 1. Characteristics of the faculty and medical students, who responded to the survey, in relation to gender and year of enrollment.

Faculty (N=66) % (n/total)	Medical students (N=236) % (n/total)	Variables
		Stage of medical education:
59.1(39/66)	70.0(184/263)	Pre-clinical (3rd and 4th years)
40.9(27/66)	30.0(79/263)	Clinical (5th and 6th years)
		Year of enrollment (student):
- -	38.6(91/142)	Third
- -	35.4(93/123)	Fourth
- -	17.1(45/56)	Fifth
- -	12.9(34/55)	Sixth
		Gender:
59.1(39/66)	69.2(182/263)	Male

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40.9(27/66)	30.8(81/263)	Female
		Internet accessibility:
100.0(66/66)	100.0(263/263)	At office/ college library
42.4(28/66)	81.0(213/263)	At home

Table 2. Frequency and reasons for OBD utilization, and self rated proficiency among participants.

Faculty (N=66) % (n/total)	Medical students (N=236) % (n/total)	Variables
86.4(57/66)	71.1(187/263)	**Used OBD in the last year**
		Frequency of using OBD in the last year:
15.8(9/57)	69.5(130/187)	1- 5 times
22.8(13/57)	17.6(33/187)	6- 10 times
61.4(35/57)	12.8(24/187)	> 10 times
		Types of articles and purpose of OBD searching:
21.1(12/57)	39.0(73/187)	Assignments-Clinical guidelines-Projects!
52.6(30/57)	47.6(89/187)	Epidemiology-Clinical guidelines
75.4(43/57)	26.7(50/187)	Clinical guidelines-EBP**
33.3(19/57)	22.5(42/187)	Review-Clinical guidelines-Assignments
31.6(18/57)	4.3(8/187)	EBP-Clinical Guidelines-Review article
57.9(33/57)	- -	Journal (for publication)
		Self rating of proficiency in using OBDs
36.8(21/57)	5.9(11/187)	Very Proficient
47.4(27/57)	18.2(34/187)	Somewhat proficient
12.3(7/57)	45.5(85/187)	Not very proficient
3.5(2/57)	20.9(39/187)	Not proficient at all
- -	9.6(18/187)	Not sure

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Table 3 -Training needs and their interest in training for OBD among participants

Faculty (N=66) % (n/total)	Medical students (N=236) % (n/total)	Variables
		Received training on OBD searching
22.8(13/57)	95.7(179/187)	Yes
77.2(44/57)	4.3(84/187)	No
		Contents of the received training:
12.3(7/57)	100.0(179/179)	Basic search methods
12.3(7/57)	- -	OBD specific searching methods
		Interested in OBD training:
84.8(56/66)	85.9(226/263)	Yes
15.2(10/66)	14.1(37/263)	No
		Reasons for not using OBD:
13.6(9/66)	35.4(93/263)	Lack of training
3.0(2/66)	23.2(61/263)	Previous unsatisfactory results
- -	3.4(9/263)	Cost implications
- -	4.9(13/263)	Difficult to use
3.0(2/66)	18.3(48/263)	Not needed for my work

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Table 4 - Stated frequency of using various OBD among participants.

Faculty (N=66) % (n/total)	Medical students (N=236) % (n/total)	Variables
		PubMed:
28.1(16/57)	69.5(130/187)	1-5 times
38.6(22/57)	15.0(28/187)	6-10 times
33.3(19/57)	15.5(29/187)	> 10 times
		Medscape:
24.6(14/57)	23.5(44/187)	1-5 times
21.1(12/57)	4.8(9/187)	6-10 times
31.6(18/57)	4.8(9/187)	> 10 times
		MD Consult:
21.1(12/57)	7.5(14/187)	1-5 times
5.3(3/57)	6.4(12/187)	6-10 times
14.0(8/57)	1.6(3/187)	> 10 times
		Cochrane Collaboration:
14.0(8/57)	- -	1-5 times
3.5(2/57)	- -	6-10 times

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