

## Knowledge and attitudes of students of College of Medicine towards evidence-based medicine and barriers to its use in clinical practice in Erbil city, Iraq

Received: 6/8/2014

Accepted: 24/12/2014

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### Abstract

**Background and objective:** Evidence-based medicine, by guiding medical care towards meaningful outcomes to patients, has a significant worldwide impact on medical care and education. It is important that medical students, whom are the future physicians, keep themselves updated with recent advancement in medical knowledge and health care. The aim of this cross-sectional study was to determine the attitude, knowledge and barriers among students towards evidence-based medicine and making them familiar with the concept and advantage of evidence based medicine.

**Methods:** A cross-sectional study was conducted on 163 sixth year students of the College of Medicine at Hawler Medical University during the period from October 2012 to May 2013. The response rate was 86.5%. Knowledge towards evidence-based medicine, accessing and interpreting evidence and perceived barriers to practice evidence-based medicine among participants were the main outcome measures.

**Results:** Of 141 of participants that filled the questionnaire, only 69.5% had heard about evidence-based medicine. Around 82% stated that they had knew evidence-based medicine and only 23.5% had knew steps of evidence-based medicine. Around 65% of respondents welcomed the promotion of evidence-based medicine and 74.4% agreed with that finding from the current study in which it would be helpful in daily management of patients. Furthermore, 31.6% of students reported that standard textbook as a frequent source used for medical knowledge. Around 91% of students did not know the strongest evidence in the hierarchy of evidence and only small proportion of students reported that they understand the common epidemiological concepts that are used in evidence-based medicine.

**Conclusion:** Evidence-based medicine is relatively a new concept among students at the College of Medicine in Erbil. Although the students appeared interested in learning and implementing evidence-based medicine in clinical practice, they need more guidance and training to ensure the correct use of evidence-based medicine ideals.

**Keywords:** Evidence-based medicine, Knowledge, Barriers, Erbil-Iraq.

### Introduction

Evidence-based medicine (EBM) is defined as the "conscientious, explicit, and judicious use of current best evidence".<sup>1,2</sup> Later David Sackett et al, refined the definition of EBM as "Integrating the best research evidence with clinical expertise and patient values and circumstances to achieve the best possible patient management".<sup>1</sup> By best research evidence we mean valid and relevant research, often from the basic sciences of medicine,

however the patient-centered clinical research into the accuracy of diagnostic tests, the power of prognostic markers, the efficacy and safety of therapeutic, rehabilitative and preventive regimens should be taken in consideration. By clinical expertise we mean the ability to use our clinical skills and past experience to rapidly identify each patient's unique health state and diagnosis, their individual risks and benefits of potential interventions, their personal circumstances and expectations.

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By patient values we mean the unique preferences, concerns and expectations of each patient which must be integrated into clinical decisions if they are to serve the patient. By patient circumstances we mean their individual clinical state and the clinical setting.<sup>3</sup> The patient's concerns and values also need to be taken as an important of approach and management.<sup>1</sup> To complete the practice of EBM, the following five steps are required:

Step 1: Converting the need for information about (prevention, diagnosis, prognosis, therapy, causation and...etc) into an answerable question.

Step 2: Tracking down the best evidence with which to answer that question.

Step 3: Critically appraising that evidence for its validity (closeness to the truth), impact (size of the effect) and applicability (usefulness in our clinical practice).

Step 4: Integrating the critical appraisal with our clinical expertise and with our patient's unique biology, values and circumstances.

Step 5: Evaluating our effectiveness and efficiency in implementing steps 1-4 and inquiring about ways to improve them for next time.<sup>3</sup>

EBM is a trial to improve the quality of the information on which decisions are based; unfortunately, there is a large information gap between research and clinical practice. In 1972, British epidemiologist Archie Cochrane highlighted the fact that most treatment-related decisions were based on unplanned selection of information from the vast and variable quality scientific literature, on skilled opinion, or, worse of all, on trial and error.<sup>1</sup> Medical sciences are continuously growing. In order to ensure that their skills and knowledge go with the needs of their patients, it is important that physicians and medical students, whom are the future physicians, keep themselves updated with recent advancement in medical knowledge and health care. A previous study showed that the longer since graduation from medical school the lower the accuracy in knowledge and

quality of medical care given to patients.<sup>4</sup> Knowledge and skills of EBM can be taught by many methods; however, little research has been conducted to reveal how best we can teach the knowledge, attitudes and skills of practicing and teaching EBM to medical students. There are three modes of teaching EBM; role-modeling practice of EBM, teaching clinical medicine with evidence and teaching specific EBM skills. Moreover EBM can be taught by seminars and workshops.<sup>3</sup> The utilization of research, which is the backbone of EBM, is still in its infancy in developing countries.<sup>2</sup> Previous studies proved that there was an overall positive attitude, knowledge and skills towards EBM. On the other hand, other studies stated that the concept of EBM was still unfamiliar to most of the medical students and residents, and there is in need of the incorporating formal teaching of EBM at all levels of medical education.<sup>2</sup> A number of other reports discussed responses to EBM across various disciplines in different countries.<sup>4</sup> No information is available regarding EBM knowledge and attitudes among students at Hawler Medical College in Iraq, so the aims of this study was to assess the attitude, knowledge and barriers among students and making them familiar with the concept and advantage of EBM.

## Methods

### Study Sample:

This cross-sectional study was conducted on the sixth stage medical students in the College of Medicine, Hawler Medical University in Erbil governorate, capital of Iraqi Kurdistan region. During the academic year 2012–2013, 163 sixth stage medical students were distributed into four groups; the first three groups consisted of 41 students and the last group consisted of 40 students. The four groups joined the mandatory two weeks course of primary health care at Brayatii Center, the first family medicine health center which was founded in 2010.

**Questionnaire:** All students in the four groups during the period from October 2012 to May 2013 were asked to complete a self-administrated questionnaire. The response rate was 86.5%. The questionnaire was basically prepared and developed on the basis of a previous survey<sup>5</sup> to assess students' knowledge and attitude towards EBM. The study preserved the anonymity and confidentiality of participants. The questionnaire consisted of six sections (from A to F). Section A was about personal characteristics including age and sex, section B concentrated on attitudes toward EBM consisting of many questions. The main purpose of the questions was to know their familiarity with EBM, its concepts and principles or steps and their agreement about national program for teaching EBM and their agreement on EBM integration to the curriculum. Section C included several questions which focused on accessing and interpreting the evidence by knowing their participation in any formal training in research strategy and their preferable relation to electronic web base as PubMed, Medline, Cochrane or other bibliographic databases and their most frequent sources of medical knowledge as standard textbook. Section D was about their knowledge on terms like relative risk, absolute risk, odds ratio, and other common epidemiological terms that are used in articles and studies of EBM. Section E contained the most important barriers that anticipate the application of EBM in practice according to student's insight, like lack of personal time, lack of knowledge, lack of training, absence of library in the locally, limited resource and

facilities, lack of appropriate information, lack of critical appraisal skill, absence of an effective computer system, lack of emphasis on EBM in undergraduate curricula and EBM is difficult to understand. In the latter part of the study and after students finished the first five parts of the questionnaire, there was a short seminar to discuss the importance, steps, and concepts of EBM and how to apply it to any medical information. Then section F part of the questionnaire was distributed, which contained an example of the use of statin drug by a randomized clinical trial and all participants were asked to categorize the type of study as grading of evidence A, B or C depending upon EBM. Grading of evidence was simply defined as: level A: evidence from a systematic review of all relevant randomized controlled trials, level B: evidence obtained from at least one well-designed Randomized Controlled Trial, and level C: evidence obtained from well-designed controlled trials without randomization.

**Statistical analysis:** The statistical package for the social sciences (version 18) was used for data analysis.

## Results

### Students' characteristics

Of 163 sixth year medical students at Hawler Medical University, 141(86.5%) completed the questionnaire. Ninety eight (69.5%) participants that had heard about EBM were enrolled in the subsequent analysis. The socio-demographic characteristics of the 141 students, 74(52.5%) males and 67(47.5%) females are described in Table 1.

**Table 1:** The socio-demographic characteristics of the 141 medical students at Hawler Medical University

Variable	n	%
Gender		
Male	74	52.5
Female	67	47.5
Age (year)		
≤25	132	93.6
>25	9	6.4
<b>Total</b>	<b>141</b>	<b>100</b>

**Students' EBM experience**

About two thirds of respondents (69.5%) had heard about EBM, nearly (81.6%) stated that they had knew EBM and only about (23.5%) knew the steps of EBM. Around 21% had ever received formal training in search strategy, 14.3% had received formal training in critical appraisal and only 22.4% had attended courses related to EBM. Around 24% of respondents stated that they are aware of Medline or Cochrane and only 29.6 % reported that they are aware of guidelines or protocols.

**Attitude of students toward EBM**

About 65% welcomed the promotion of EBM and 74.4% agreed on that research

finding are helpful in daily management of patients. About 77.6% stated that practicing of EBM would improves patient care, 74.5% stated that EBM reduces health care costs, and 58.2% stated that practicing EBM does not replace clinical experience. On the other hand, 48.0% stated that EBM is good concept but it has a limited value in general practice and 49.0% reported that EBM is not applicable to their culture. About 73.5% of students reported that EBM national program for teaching should be performed and 69.4% reported that EBM teaching courses should be part of curriculum for medical students. Table 2 shows the attitudes of students towards EBM.

**Table 3:** Students' level of understanding of the common epidemiological concepts that are used in EBM (N=98)

Epidemiological concept	It would not be helpful to me to understand %	Do not understand but would like to %	Some understanding %	Understand and could explain to others %
Relative risk	18.4	9.2	45.9	26.5
Absolute risk	17.3	22.4	27.6	32.7
Odds ratio	41.8	21.4	29.6	7.1
Systematic review	20.4	22.4	33.7	23.5
Meta-analysis	42.9	33.7	17.3	6.1
Number needed to treat	40.8	27.6	19.4	12.2
Confidence interval	37.8	26.5	25.5	10.2
Publication bias	39.8	25.5	21.4	13.3
Prevalence of disease	18.4	7.1	31.6	42.9
Incidence of disease	15.3	8.2	28.6	48.0
Cohort study	27.6	25.5	25.5	21.4
Cross sectional study	19.4	19.4	39.8	21.4
Case control study	16.3	20.4	42.9	20.4
Randomized clinical study	21.4	12.2	49.0	17.3
Sensitivity of a diagnostic test	11.2	16.3	31.6	40.8
Specificity of a diagnostic test	18.4	8.2	25.5	48.0
Heterogeneity	36.7	19.4	17.3	26.5
Clinical effectiveness	26.5	23.5	28.6	21.4

**Barriers to practicing EBM**

Table 4 shows several perceived barriers to practicing the EBM that were reported by students. Lack of training, lack of emphasis on EBM in undergraduate curriculum, and lack of appropriate skills were the most commonly reported barriers and found to be 85.7%, 78.6% and 78.6%, respectively.

**Grading of evidence and the usefulness of EBM short seminars**

When students were asked about the statin study in order to evaluate the hierarchy of the evidence, the obtained results showed that 63.3%, 32.7% and 4.1% were within the grade of evidence A, B and C, respectively. On the other hand, when they were asked about the feasibility of a short seminar on the concepts and steps of EBM, and randomized controlled trial example, 84.7% of students reported that it is very useful.

**Discussion**

About 65.3% of participants had positive attitude and welcomed the promotion of EBM, 77.6% stated that practicing of EBM would improves patient care, and reduces health care costs, and 48.0% stated that EBM is good concept but it has a limited value in general practice. However, the present study revealed that only small

proportion of students reported that they understand and able to explain the common epidemiological concepts that are used in EBM, results which are similar to another studies.<sup>6,7</sup> The results of this study confirm the idea that practice of EBM is still in its early stage in our college. Even those who had some idea about EBM, they consider EBM is equivalent to experts' opinions, eliciting clinical findings and ordering laboratory investigations. The most commonly mentioned barrier to the practice of EBM was lack of training, lack of emphasis on EBM in undergraduate curricula and lack of critical appraisal skills. This could be explained by the fact that EBM is a relatively new concept and consequently training courses in EBM are rare. One way to increase the time available to practice EBM would be to change the emphasis of postgraduate education from lecturing to training in the access and interpretation of evidence and in the use of these skills in practice.<sup>8,9</sup> This would require a major initiative at all three levels of education, i.e., undergraduate, postgraduate and CME. Various strategies can be adopted to bring the awareness and improve the skills regarding practice of EBM. These need to be targeted a all levels of medical education.

**Table 4:** Perceived barriers to practicing EBM (N=98).

Barrier	n	%
Lack of personal time	68	69.4
Lack of knowledge	71	72.4
Lack of training	84	85.7
Absence of library in the locally	54	55.1
Limited resources and facilities	64	65.3
Lack of appropriate information	65	66.3
Lack of critical appraisal skills	77	78.6
The absence of an effective computer system	41	41.8
Lack of emphasis on EBM in undergraduate curricula	77	78.6
EBM is difficult to understand	58	59.2

EBM workshop is an important tool. This can quickly build the required knowledge, skills and attitudes pertaining to EBM. Such workshops have worked in Pakistan for both under graduates and practicing students.<sup>10</sup> The term EBM entered the lexicon in 1992. Since then, it has become the latest focus in the search for improved health care. The utilization of research, which represents the backbone of EBM, is still in its early stage in developing countries. A study conducted in Pakistan found that only 20% of residents read medical journals on the monthly basis, only 12% had ever wrote for medical journal publication, and 12% had never read a medical journal.<sup>11</sup> In the current study; insufficient time was another barrier; this might be attributed to extremely heavy workloads. The obstacle of insufficient time was echoed in many other studies.<sup>12,13</sup> Lack of knowledge was another barrier by the two-thirds of the participants of this study which is in agreement with findings of other studies,<sup>14</sup> while others found the main barrier to be limited access.<sup>9,15,16</sup> There is variation in how EBM is taught and there are studies that have focused on different types of EBM courses for students such as workshops, morning reports, rounds, seminars, short courses and journal clubs.<sup>17-19</sup> Prior to seminar about EBM, our student's knowledge and how to use evidence in clinical practice was poor, and 90.8% of students did not know the strongest evidence in the EBM concept in the hierarchy of evidence. However, there was improvement in their practicing evidence-based after the seminar, were 64% of them solved the clinical based example correctly, and 84.7% of them reported that the seminar was very useful. This finding was in agreement with the finding of others.<sup>6,7,20</sup> This study has a number of limitations. Students of groups 2, 3 and 4 will hear about the research of EBM from their colleagues of group 1, which will inflate the level of knowledge. Secondly, some of the closed ended questions in the questionnaire are leading

questions. Finally, there are a considerable proportion of students that mentioned they know many epidemiological terms, but it is difficult to confirm that they really know them.

### Conclusion

EBM is a relatively new concept and its implementation at the College of Medicine in Erbil is in its infancy. Using the evidence and incorporating patients' values and preferences are extremely significant for this paradigm of medical practice. EBM is an essential competency for modern day medical education which has positive impact on health care outcomes. Integration of EBM into a medical school curriculum results in an improvement of attitude about EBM and also an improvement in self-reported skills for using EBM. Further study is needed to assess the long-term effects of teaching EBM on future medical practice.

### Conflicts of interest

The authors report no conflicts of interest.

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