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# Evidence-Based Medicine: Studying the Attitude of Medical Residents in Mashhad

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**ABSTRACT**

**Introduction:** Evidence-Based Medicine (EBM) means ensuring that the right patient has received the appropriate treatment and it strives to form a common scientific language for all doctors. It uses the combination of the best available knowledge (evidence) and clinical experience beside the patient values. This study was designed to investigate the attitude of medical residents of Mashhad University of Medical Sciences towards EBM.

**Materials and Methods:** In this cross sectional study a self-designed questionnaire was used for data collection. The study was performed in the autumn of 2012 in Mashhad University of Medical Sciences, Mashhad, Iran. The study aimed at investigating the attitude of medical residents towards EBM and evaluating its use in medical practice. Questionnaires' data were analyzed by the SPSS Version 13.

**Results:** 49 (52.1%) residents were familiar with the concept of EBM whereas 45 (47.9%) were not. The rate of familiarity with EBM concepts was (26.5%) in the surgical fields and (73.5%) in the non-surgical ones, showing a meaningful difference (p=0.014). There was a significant correlation between the field of study and knowledge about the concepts of EBM, whereas a greater number of non surgical residents were familiar with its concept in comparison to surgical residents (73.5% vs. 26.5%, p=0.014).

**Conclusion:** The concepts of EBM are familiar to (82%) of medical residents of Mashhad and regarding the increasing importance of this science, upgrading EBM concepts in a timely and accurate planning is highly recommended.

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## Introduction

The method of Evidence Based Medicine (EBM) was first used after the French revolution in Paris.

Some scholars believe that it has some roots in Chinese traditional medicine. Today's so-called Evidence Based Medicine was introduced in 1992 by a Canadian epidemiologist named Gordon Guyatt and his colleagues from the McMaster University of Canada (1). EBM means ensuring that the right patient has received the appropriate treatment and it strives to form a common scientific language for all doctors. It uses the combination of the best available knowledge (evidence) and clinical experience beside patient values. Evidence has always been one of the most important factors for all decision makings and activities of a human being.

In a science like medicine which is in direct contact with the patients' health and life, the best possible approach should be used in the diagnosis and treatment of patients besides minimizing the probable medical errors (2- 4). Unfortunately today, despite the efforts made, many healthcare providers even in the level of specialists and medical residents are generally unfamiliar with the concepts of EBM. Due to the importance of this group in clinical decision making and also the education of juniors, a strong need for comprehensive and appropriate training regarding the applications of EBM is evident in this medical group (5). On the other hand, medical residents are usually the first level in the healthcare team which a patient visits so their key role in using EBM concepts in daily practice and clinical decision making becomes even more prominent. However, despite the 20-year history of EBM, very few studies regarding this issue have been performed in Iran. Therefore, this study was designed to investigate the attitude of medical residents


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of Mashhad University of Medical Sciences towards EBM concepts.

## Materials and Methods

*Study setting*

In this cross sectional study a self-designed questionnaire was used for data collection. The study was performed in the autumn of 2012 in Mashhad University of Medical Sciences, Mashhad, Iran. As the study aimed at investigating the attitude of medical residents towards EBM and evaluating its use in medical practice, in a meeting with the head of the Post Graduate Office of MUMS, the aims of the study were widely defined. The self-designed questionnaire consisted of two main parts: the first part included demographic data (sex, age, field of study, work experience and the residency year), internet accessibility and understanding of the concept of EBM.

The second part which contained 9 questions focused on the residents overall attitude towards EBM and its applicability in clinical practice based on the triplet Likert scale.The questionnaire draft was designed after studying the related literature; it was then approved by five university professors who were experts in this field regarding content validity. In order to study face validity the questionnaire was distributed among 20 medical residents as a pilot study. To evaluate its reliability, the Cronbach's alpha was determined as (0.837).

For sample collection the convenience method was used and 120 self-designed research questionnaires were distributed among medical residents before staring the EBM workshop. Twenty minutes was given for completing the questionnaire. Then they were collected and those with less than (50%) completion were excluded. The remaining questionnaires' data were analyzed by the SPSS Version 13.

## Results

*Demographic data:* From the 120 distributed questionnaires among the medical residents of different fields, 100 completed ones were returned. 39 belonged to male and 61 to female residents. 33 were under the age of 30 yrs, 48 had 31-35 yrs and 19 were older than 35 years. 64 residents had a ≤ 3-year work experience before starting residency whereas the other 36 had over 3 years of work experience. 56 were year one or two residents while 44 were of higher levels.

The highest number of residents belonged to the field of gynecology (26%) followed by pediatrics (18%).

The rate of social medicine, psychology, general surgery, cardiology, emergency medicine and otolaryngology residents were (7%, 13%, 9%, 16% and 2%), respectively. The residents were divided into two main groups: non-surgical (social medicine, psychology, cardiology, emergency medicine and pediatrics) with (63%) and surgical (otolaryngology, general surgery and gynecology) with (37%).

*Familiarity with the concepts of EBM:* 49 (52.1%) residents were familiar with the concept of EBM whereas 45 (47.9%) were not. Table 1 shows the prevalence of familiarity with EBM concepts, percentage of internet access per day, and frequency of search engines application in the previous year based on the field of study.

**Table 1: The prevalence of familiarity with EBM concepts, percentage of internet access per day, and frequency of search engines application in the previous year based on the field of study.**

| Field of study | | Non surgical | Surgical |
|---|---|---|---|
| No/% | | 63(63%) | 37(37%) |
| Familiarity with EBM concepts (No/%) | | 36(73.5%) | 13(26.5%) |
| Internet access per day | 25% | 23(51.1%) | 22(48.8%) |
| | 50% | 10(15.8%) | 5(13.5%) |
| | 75% | 12(9%) | 3(8.1%) |
| | 100% | 18(28.5%) | 7(18.9%) |
| Frequency of search engines application in the previous year | ≤5 | 22(34.9%) | 19(51.3%) |
| | 6-10 | 15(23.8%) | 26(41.2%) |
| | ≥10 | 10(27%) | 8(21%) |

The rate of familiarity with EBM concepts was 26.5% in the surgical fields and 73.5% in the non-surgical ones, showing a meaningful difference (p=0.014). The percentage of daily internet access showed no meaningful difference between the two groups (p=0.153). In addition, the frequency of search engines application was almost similar in the two fields (p= 0.118). In table 2, the prevalence of familiarity with EBM concepts has been shown based on sex, age group and work experience.

**Table 2: The prevalence of familiarity with EBM concepts based on sex, age group and work experience**

| | | Familiarity with EBM concepts | | P value |
|---|---|---|---|---|
| | | Yes (No/%) | No (No/%) | |
| Field of study | Non surgical | 36(73.5%) | 22(36.5%) | 0.014 |
| | Surgical | 13(26.5%) | 23(63.8%) | |
| Age group | ≤ 30 yrs | 23(69.6%) | 10(30.3%) | 0.019 |
| | 30-35 yrs | 21(47.7%) | 23(52.2%) | |
| | ≥ 35 yrs | 5(29.4%) | 12(70.6%) | |
| Sex | Female | 26(47.2%) | 29(52.7%) | 0.263 |
| | Male | 23(58.9%) | 16(41.1%) | |
| Work Experience | ≤ 3 yrs | 34(56.6%) | 26(43.4%) | 0.242 |
| | >3 yrs | 15(44.1%) | 19(55.9%) | |
| Frequency of search engines usage in the last year | <5 | 17(45.9%) | 20(54.1%) | 0.067 |
| | 5- 10 | 9(39.1%) | 14(60.9%) | |
| | >10 | 23(67.6%) | 11(32.4%) | |

A significant correlation between the field of study and knowledge about the concepts of EBM was obtained whereas a greater number of non surgical residents were familiar with its concept in comparison to surgical residents (73.5% vs 26.5%, p=0.014). In the age group of less than 30 yrs, 30-35 yrs and more than 35 yrs, 23 (69.6%), 21 (47.7%) and 5 (29.4%) were familiar with the concept of EBM; showing a significant difference (p=0.019). Sex (p=0.263), work experience (p= 0.242), and the number of times of search engines usage (p=0.067) were not influential factors on the knowledge of EBM concepts.

The residents familiar with the concept of EBM had gained their information from a training course (39.1%), internet (28.3%), scientific papers and journals (13%), internet and journals (10.9%), or internet and training courses (8.6%), respectively.

*The attitude of residents toward EBM:* The residents' attitude towards EBM was investigated through 9 questions. Questions number 1, 3, 5, 7, 8 and 9 were designed in agreement with the concepts of EBM, whereas number 2, 4 and 6 were in disagreement with its concept. A positive attitude was achieved by dividing the total score of all 9 questions (score 1 for agreement in positive questions and disagreement in negative ones and a zero score for other responses) over 2 plus 1 (total score≥5). Accordingly, in the final analyses 82% of the residents had a positive attitude towards EBM. In table 4 the relationship between attitude towards EBM with knowledge about its concepts, age, sex, work experience, field of study and residency year has been displayed.

**Table 3: Frequency distribution of residents' responses to questions on attitude towards EBM**

| Questions on attitude towards EBM | Disagree (No/%) | No comment (No/%) | Agree (No/%) |
|---|---|---|---|
| I want my patients to use new treatments and interventions | 3(3%) | 1(1%) | 96(96%) |
| My knowledge inpatient treatment is more than experts in this field | 61(61%) | 24(24%) | 13(13%) |
| I want my patients to use newly discovered treatments and interventions by researchers | 13(13%) | 14(14%) | 73(73%) |
| Newly discovered treatments and interventions by researchers are not applicable in clinical practice | 56(56%) | 17(17%) | 27(27%) |
| I use novel knowledge in the treatment of patients even if totally different from my previous views on the treatment of such diseases | 16(16%) | 27(27%) | 57(57%) |
| I only use the knowledge of papers which have been referenced in textbooks | 31(31%) | 14(14%) | 55(55%) |
| The use of recent researches results in better decision making and treatment selection | 6(6%) | 10(10%) | 84(84%) |
| EBM leads to better criticism of scientific papers and identification of the most valid ones | 6(6%) | 13(13%) | 81(81%) |
| The addition of an EBM training course during the residency period is a necessity | 24(24%) | 14(14%) | 62(62%) |

**Table 4: The relationship between attitude towards EBM with knowledge about its concepts, age, sex, work experience, field of study and residency year**

| | | Attitude towards EBM | | P value |
|---|---|---|---|---|
| | | Positive (No/%) | Negative (No/%) | |
| Knowledge on EBM concepts | No | 35(44.9%) | 10(62.5%) | 0.199 |
| | Yes | 43(55%) | 6(37.5%) | |
| Field of study | Non Surgical | 54(65.5%) | 9(50%) | 0.207 |
| | Surgical | 28(34%) | 9(50%) | |
| Age group | ≤ 30 yrs | 28(24.1%) | 5(27.8%) | 0.852 |
| | 30-35 yrs | 39(47.5%) | 9(50%) | |
| | ≥ 35 yrs | 15(18.3%) | 4(22.2%) | |
| Sex | Female | 28(34.1%) | 11(61.6%) | 0.034 |
| | Male | 28(24.1%) | 7(38.9%) | |
| Work experience | ≤ 3 yrs | 57(69%) | 7(38.9%) | 0.014 |
| | >3 yrs | 25(30%) | 11(61.1%) | |
| Residency year | Year 1 and 2 | 45(54%) | 11(61.1%) | 0.630 |
| | Year 3 and 4 | 37(44%) | 7(38.9%) | |
| Frequency of search engines usage in the last year | <5 | 29(35%) | 12(66.7%) | 0.047 |
| | 5- 10 | 23(28%) | 2(11.1%) | |
| | >10 | 30(36.6%) | 4(22.2%) | |

There was no meaningful correlation between attitude towards EBM with knowledge on EBM concepts, clinical field of study, age group and the residency year. However, sex (P=0.034), work experience before residency (p=0.014) and number of times of search engines application in the previous year (p=0.047) showed a significant relationship with attitude towards EBM.

## Discussion

In the present study 49 residents (52.1%) were familiar with the concepts of EBM whereas 45 (47.9%) had no knowledge regarding this issue. The rate of knowledge on the concepts of EBM in surgical and non-surgical fields was (26.5%) and (73.5%), respectively, showing a significant difference (p=0.014). The study by Sadeghi in Kerman on 94 medical residents revealed that only (23%) were

familiar with EBM whereas 6.4% believed that the concepts of EBM are not applicable in clinical practice.

Taleb in 2010 showed that only (7.5%) of the medical staffs of Mashhad University Hospitals were familiar with EBM (6). In the study by Zare in Tabriz, it was reported that (45.3%) of the responders used EBM in their clinical decision-making (7). The reason for such high statistics was the establishment of active training centers of EBM in Tabriz Medical University.

The residents' knowledge regarding EBM was (52.1%) in our study, slightly higher than Tabriz study.

This could be justified by the establishment of an EBM training center in Mashhad in 2012. In addition, the better internet access of most medical personnel of Mashhad University during the past two years has led to better results in comparison to Taleb's study performed in 2010 (6), which had reported difficult internet access as the most important limitation. In the present study (55%) of the residents had access to the internet at least (50%) of the time in 24 hrs. Kitto in Australia (8) showed a positive attitude in surgeons towards EBM in which the surgeons welcomed the new research in the field of surgery as they could result in better improvement and fewer complications in patients. In the current study a significant difference was observed between the clinical field and knowledge on the concepts of EBM, whereas a greater number of non-surgical residents were familiar with this issue in comparison to surgical ones (p=0.014). Yet, there was no relationship between the clinical field and a positive attitude towards EBM (p=0.207). Moreover, the rate of search engines usage was similar between the two groups (p=0.118). Graham's study (9) in New Zealand showed that despite the positive attitude of medical doctors towards EBM (84%), a smaller number of them (56%) took advantage of this knowledge in daily practice. Kotur (10) in India showed that adding EBM concepts to the curriculum of medical students results in better clinical judgment by them. Nevertheless, a meaningful correlation was found between attitude towards EBM and work experience before residency (p=0.014). Also the rate of search engine usage in the previous year was correlated with attitude (p=0.047), meaning that those who used the search engines more often had a more positive attitude towards EBM.

Accordingly, around (41%) of the residents had used search engines very few times during the previous year, (52.1%) were familiar with the concepts of EBM, while (82%) of them had a positive attitude towards EBM; it seems that the reason for this inconsistency is the lack of adequate time for searching papers and the lack of skill for identifying high value research. Therefore, providing relevant training sessions to familiarize residents with the principles of EBM seems necessary.

Nonetheless, in order to implement this knowledge in clinical practice appropriate clinical settings should also be taken into consideration. On the other hand, given the tight time schedule of residents, it seems that holding practical sessions such as EBM-based Journal clubs, morning reports or educational rounds could be appropriate strategies to achieve this goal and increase the application of EBM in daily medical practice.

Considering the findings of this study, holding EBM educational classes and improving the knowledge of residents in this field can have a key role in the better diagnosis and treatment of patients and will increase their knowledge about the new methods used beside clinical experience; therefore resulting in minimized medical errors in future practice.

One of the main limitations of this study was the lack of accessibility to all 1st year residents due to the need for their constant presence beside patients in emergency units and to 4th year residents due to their great workload and absence in hospitals.

## Conclusion

The concepts of EBM were familiar to (82%) of medical residents of Mashhad and regarding the increasing importance of this science, upgrading EBM concepts in a timely manner and by precise planning is highly recommended.

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