

## Knowledge, Attitude and Practice of Infectious Disease Residents of Shahid Beheshti Medical University regarding Evidence-Based Medicine

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### Abstract

**Background and purpose:** The characteristics of residents of infectious diseases who should practice and teach evidence based medicine (EBM) during their clinical work – and their attitudes toward it – are poorly known. We assessed the knowledge, attitude and practice of infectious diseases residents regarding evidence based medicine and their related educational needs.

**Methods:** This cross-sectional study was conducted during February 2007. Residents of infectious diseases from Shahid Beheshti medical university received a self-administered questionnaire and all of them participated in the study. Their attitude on EBM, their ability to access online resources, and their understanding of relevant terminology were assessed.

**Results:** Thirty four residents responded and returned the questionnaire. Most respondents showed welcoming attitude towards EBM. The median value for the estimated percentage of the residents' clinical practice that was evidence based was 50%. Only one had received training in EBM and none was educated about critical appraisal. The median number of Medline search for management of patients was 4 times in the last year and most residents were even unaware of EBM resources. Although more than 80% had some understanding about terms like relative risk and odds ratio, the understanding was less than 50% for technical terms such as systematic review and meta-analysis.

**Conclusions:** We recommend that university teaching programs should promote and incorporate EBM training in all levels of medical education.

**Keywords:** EVIDENCE-BASED MEDICINE, MEDICAL EDUCATION, SURVEY, ATTITUDE, KNOWLEDGE.

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### Introduction

Old medical practices depended on unsystematic observations of clinical experience, an understanding of pathophysiology of disease, common sense and clinical experience as a means for building and maintaining knowledge of

patient management.(1) In these practices , clinicians had a number of options for sorting out clinical problems. Reviewing textbooks and consulting local experts were considered appropriate ways of obtaining medical information.(2) However, some recommendations in medical textbooks are not based on evidence and they tend to be outdated comparing with recent advances in scientific knowledge . In addition, new knowledge might be generated meanwhile the books are in the process of publication.(3) Experienced physicians differ in the making

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clinical judgments, which are often not based on evidence.(4)

Despite the development of rigorous clinical trial methods, physicians have been aware of the gap between the results of blinded randomized clinical trials and the practical use of treatments in the usual clinical setting. This gap results in expensive, ineffective or even harmful, decision making. (1,5) Evidence-based medicine (EBM) is "the conscientious, explicit and judicious use of current best evidence in making decisions on the care of individual patients"(6) and deals directly with the uncertainties of clinical medicine.(7)

Although research methodology is an important part of medical education, no formal training in EBM is provided in the curriculum of medical students or residents in Iran. However, residents are encouraged to use online resources; clinical guidelines are preferred to textbooks for their exams. In fact, answers to some questions in any exam during residency can only be found in recent journal articles. Residents of infectious and tropical diseases are expected to have more knowledge about EBM, since they study research methodology in a short course of 'Master of Public Health (MPH)' before they start their clinical phase. Little is known about the attitude of residents towards EBM in Iran. (8) The objectives of this study were to determine the knowledge, attitude and practice of residents of infectious diseases regarding evidence based medicine.

## Methods

This cross-sectional study was conducted during February 2007 in three teaching hospitals (Loghman Hakim, Labbafinejad and Imam Hossein hospitals) of Shahid Beheshti Medical University. The study population consisted of all residents of infectious diseases in this University.

The tool for data collection was a self-administered questionnaire, which was modified from the McColl study. (9) It included questions on their attitude towards

EBM, their ability to access online resources, their understanding of relevant terminology and their confidence in the assessment of published papers. Participants were asked to score from 0 to 10 for each item. The questionnaire was given to residents after a morning report and a second attempt was made 2 days later to those who had not responded.

The variables are presented by mean  $\pm$  standard deviation (SD) or median and inter-quartile range when not normally distributed.

## Results

A total of 34 residents (100%) responded and returned the questionnaire. Table one presents the baseline characteristics of participants.

*Attitudes towards evidence based medicine* - Figure one shows the responding residents' attitudes towards evidence based medicine. Most agreed that research findings were useful in the day to day management of patients (A).

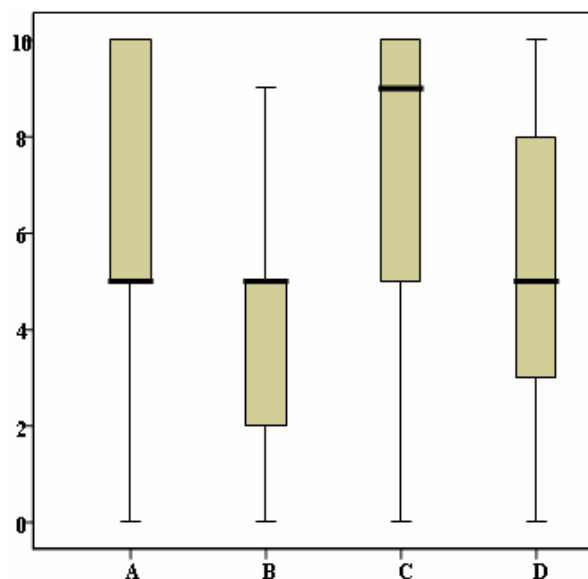
The median estimated percentage of the residents' clinical practice that was expressed as evidence based was 50% (B). Most agreed that practicing EBM improved patient care (C), but many thought that EBM had limited usefulness in daily management, because many basic treatments are not evidence based (D).

*Training for EBM*-The questions about Internet search and EBM showed that 29.4% and 2.9% of residents were formally trained in these fields, respectively. None of the residents had received a formal education on critical appraisal.

*The Internet and Medline*-Table two shows the residents' access and use of the Internet resources and Medline.

*Awareness and perceived usefulness of relevant information sources*-Table three shows that the residents had a low knowledge level of accessing the intended journals, review publications, and databases relevant to evidence based medicine.

**Figure 1.** Attitudes of residents of infectious diseases towards evidence based medicine (EBM).



(A) perceived role of medical research and its results on day to day management of patients (0=no role); (B) estimated percentage of respondent's clinical practice that was expressed as evidence based; (C) practicing EBM improved patient care (0=completely disagree); (D) perceived usefulness of EBM in day to day management of patients (100=extremely useful, 0=totally useless). Box plots show maximum and minimum, median values.

**Knowledge of EBM terminology**-Table four shows the 34 residents understanding of the terms used in EBM. Thirteen of the respondents (59%) could understand and explain at least one term to others, and five (23%) could explain five or more terms.

## Discussion

There was an ideal overall response rate (100%) in this study, but some questions were left unanswered, mainly in the sections on Knowledge of information sources and knowledge of EBM terms. Even if we consider these subjects as non-responders, the response rate will be comparable to similar studies who reported response rates between 66.7-85.5%. (7,9,11)

This study showed that most residents had a positive attitude towards EBM. Although most of the respondents agreed that practicing

evidence based medicine improved patient care, the median value for the estimated percentage of their clinical practice that was evidence based was 50%. These findings are similar to the results of McColl et al.<sup>[9]</sup> In addition, only half of them believed that EBM could be useful in their daily patient management (figure 1). This shows a relative lack of our residents' trust in EBM and warrants dissemination of the EBM concept. The residents response on items related to training for EBM showed that there was a considerable defect in our curriculum in this regard. Residents of infectious diseases are required to pass a course of MPH before they start their clinical phase, during which many aspects of EBM should be covered, but our results indicated that this part of their curriculum is neglected.

Access to the Internet and relevant databases was thought to be available at the hospital libraries in 64.7% and 58.8% of the respondents. In reality all libraries had access to the Internet, Medline, and most other databases. These figures were similar to those of McColl study and showed that better communication and informing measures is needed at local libraries and in wards to remind the residents and staff on the available online resources at their disposal. (9) It is also interesting that some respondents reported access to the Internet but not to Medline, which is an open access database (for example 27 had access to the Internet from home, but only 18 had access to Medline). This showed a poor knowledge of medical databases.

Participants had a low knowledge level of using publications and databases relevant to EBM; only few did use them in clinical decision making. However, this result is similar to results found in similar studies. (8,9,11,12) The practice of evidence based medicine involves integrating individual clinical expertise with the best available external clinical evidence from systematic research. (6) Much of this clinical evidence has already been identified, critically appraised, and packaged in

**Table 1.** Baseline characteristics of residents of infectious diseases who returned the EBM questionnaire (n=34).\*

Variables	Description	Value
Sex: n (%)	Male	27 (79.4%)
	Female	6 (17.6%)
Age: years, mean $\pm$ SD (range)		33.1 $\pm$ 4.0 (27-41)
Level of residency education n (%)	First year**	14 (41.2%)
	Second year	7 (20.6%)
	Third year	4 (11.8%)
	Fourth year	4 (11.8%)

\* Some respondents did not answer all the questions.

\*\* Some senior residents may have misidentified themselves as first year residents

**Table 2.** Access and use of Internet resources and Medline by residents of infectious diseases.

Variable		Number	Percent
Access to the Internet	Home	27	79.4
	Library	22	64.7
	Medical ward	7	20.6
Access to Medline	Home	18	52.9
	Library	20	58.8
	Medical ward	6	17.6
Usage of online resources in the past year	Never	11	32.4
	1-4 times	8	23.5
	5-10 times	7	20.6
	> 10 times	8	23.5

**Table 3.** Knowledge of residents\* about accessing journals, review publications, and databases relevant to evidence based medicine and their usefulness. Figures are numbers (percentages) of subjects who ticked each response.

Publication	Unaware	Aware but not used	Read	Used to help in clinical decision
Bandolier (published in Oxford)	24/25 (96)	1/25 (4)	0/25 (0)	0/25 (0)
Evidence-Based Medicine (BMJ publishing group)	20/26 (77)	3/26 (12)	2/26 (8)	1/26 (4)
Effective Health Care Bulletins (Universities of Leeds and York)	23/25 (92)	1/25 (4)	1/25 (4)	0/25 (0)
Cochrane Database of Systematic Reviews	22/25 (88)	1/25 (4)	1/25 (4)	1/25 (4)
Database of Abstracts of Reviews of Effectiveness (part of Cochrane Library)	22/26 (85)	2/26 (8)	1/26 (4)	1/26 (4)
Evidence-Based Purchasing (South and West R&D)	23/25 (92)	2/25 (8)	0/25 (0)	0/25 (0)

\*Some respondents did not answer all the questions.

**Table 4.** Understanding of terms used in EBM by infectious disease residents.\* Values are numbers (percentages) of subjects who ticked each response.

EBM term	It would not be helpful for me to understand	Don't understand but would like to	Some understanding	Understand and could explain to others
Relative risk	1/26 (4)	3/26 (12)	8/26 (31)	14/26 (54)
Absolute risk	1/25 (4)	7/25 (28)	7/25 (28)	10/25 (40)
Odds ratio	0/24 (0)	3/24 (13)	11/24 (46)	10/24 (42)
Number needed to treat	7/25 (28)	11/25 (44)	5/25 (20)	2/25 (8)
Confidence interval	2/25 (8)	5/25 (20)	11/25 (44)	7/25 (28)
Heterogeneity	9/24 (38)	10/24 (42)	3/24 (13)	2/24 (8)
Clinical effectiveness	1/24 (4)	11/24 (46)	9/24 (38)	3/24 (13)
Systematic review	4/23 (17)	11/23 (48)	7/23 (30)	1/23 (4)
Meta-analysis	4/25 (16)	9/25 (36)	9/25 (36)	3/25 (12)
Publication bias	7/25 (28)	10/25 (40)	3/25 (12)	5/25 (20)

\*Some respondents did not answer all the questions.

extracting journals and databases. Most of these databases are available to residents of Shahid Beheshti medical university on request without charge. Without using current best evidence, medical practice could not offer a good care and this might inflict harm to patients. (6)

Our respondents showed a partial understanding of the special terms used in EBM. However, they had better understanding of basic statistical terms. This showed that even a course of MPH has not increased their research knowledge. Interpretation of evidence is a key element in practicing EBM, and this partial understanding could hinder interpretation and make dissemination of evidence to other members of the management team more difficult.<sup>[9]</sup> Our participants reported a rate of understanding similar to general physicians from England<sup>[9]</sup> and New Zealand. (10)

There are some limitations to our study. First, we had a small sample size and a larger study involving interns, general physicians, residents and the attending of different

specialties would provide a better status of EBM in Iran. Second, we used a self-administered questionnaire while a performance test on EBM use may give more solid results.

## Conclusions

Most residents of infectious diseases showed welcoming attitude towards EBM and some of them incorporated it in daily practice. Many of them were considered poor users of Medline and other relevant databases during the last year. We believe that EBM training should be included in all undergraduate and postgraduate medical program.

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