



## Evidence- based medicine performance among health care providers in Iranian hospitals: A nationwide survey

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### Abstract

**Background:** Evidence- Based Medicine (EBM) refers to the ability and skill in the use and integration of the best evidence obtained from repeatable bias-free clinical trials with the patients' preferences and conditions. Considering this fact that few large-scale studies have been done in this field in Iran, the present study aimed at comprehensively reviewing the status of EBM performance among health care providers in Iranian hospitals.

**Methods:** This cross-sectional study was conducted during 2014 and 2015. Study participants consisted of 2800 health care providers (physicians, nurses, midwives, and paramedical personnel) in active hospitals in Iran. Data collection tool was a self-made questionnaire. Content validity of the questionnaire was improved by comments of 10 experts. The reliability of the questionnaire was assessed using test-retest method ( $\alpha=0.85$ ).

**Results:** The results revealed that only 12.7% and 15.8% of the participants were highly familiar with EBM databases and terminologies, respectively. Most participants believed that EBM-related workshops and practical involvement in EBM-related programs and activities can have a more effect on the improvement of EBM performance. Most participants had a positive view of the EBM. About 47% of the participants reported that their EBM knowledge and skills is high. Among the demographic variables, there were only significant relationships between work experience and attitude, gender and attitudes, and between knowledge and skills ( $p<0.05$ ).

**Conclusion:** According to the results of the present study, it seems that holding EBM-related workshops and practical participation in EBP-related programs and activities as well as improving facilities such as manpower, equipment, and access can have a significant effect on improving EBM- related activities.

**Keywords:** Evidence- based medicine, Health care providers, Attitudes, Knowledge, Skills

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### Introduction

In recent years, increase in elderly population, emergence of new technologies and knowledge, a rising expectations of costumers of health care services and society, and changing professional attitudes and expectations have

increased the provision of health care services (1); hence, health care providers have found trends toward evidence-based medicine (EBM) (2, 3).

EBM was considered for the first time after the French

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#### ↑What is "already known" in this topic:

Previous studies in Iran have demonstrated that knowledge, attitude, and performance level of different groups of health care providers about EBM is low.

#### →What this article adds:

Only 12.7% of the participants were highly familiar with EBM databases. Only 15.8% were highly familiar with EBM terms. Most participants believed that EBM-related workshops and practical involvement in EBM-related programs and activities could have a great impact on the improvement of EBM performance. About 47% of the participants reported that their knowledge and skills on EBM was high and very high.

Revolution in Paris, and some of its earlier roots were found in Chinese medicine. EBM modern term was proposed for the first time by a Canadian epidemiologist named Gordon Guyatt et al. from McMaster University, Canada in 1992; then, it was adopted by the Cochrane Collaboration (4).

EBM refers to the ability and skill in the use and integration of the best evidence obtained from repeatable bias-free clinical trials with the patient's preferences and conditions (5, 6). The most common definition of EBM has been provided by Dr. David Sackett. EBM refers to correct and judicious use of the current best evidence in decision-making about patients. This means integrating individual clinical expertise with the best available external clinical evidence obtained from targeted research (4).

Concurrent with the use of EBM in various fields, many studies have been conducted worldwide on knowledge, attitudes, practices (7-9), barriers and facilitators (10-18), understanding of the performance-based evidence concept (19-25), and other aspects. There are 5 basic steps in implementing EBM: (1) defining the problem, which means to develop a relevant and searchable clinical question according to the form of the disease; (2) searching for resources and databases to find relevant clinical papers; (3) critically evaluating information; (4) obtaining evidence in validity and using information and evidence missing for the intended patients; and (5) evaluating the usefulness and effectiveness of the use of such evidence (26).

EBM has been considered in many areas of medical sciences in Iran during the past few years (27, 28). Previous studies in Iran have demonstrated that knowledge, attitude, and performance level of different groups of health care providers about EBM is low (29, 30). Thus, considering the importance and position of EBM and the fact that there are few sufficient large-scale studies in this field in Iran, the present study aimed at comprehensively reviewing the status of EBM performance among health care providers in Iranian hospitals.

## Methods

This was a cross-sectional study, which was conducted in the second 6 months of 2014 and the first 6 months of 2015.

Participants were all health care providers (physicians, nurses, midwives and paramedical personnel) in active hospitals in Iran. To select the hospitals, 7 provinces were initially selected randomly from among the provinces, which are as follow: Qazvin, Golestan, Sistan-Baluchestan, South Khorasan, East Azarbaijan, Khuzestan, and Kerman. Then, 5 hospitals were randomly selected in the provincial capital in each province. Next, 80 staffs were selected from among the health care providers and included into the study.

In this study, exclusion criteria were as follow: Less than 1 year of work experience; employment in administrative and management units of hospitals; being busy with studying and working in hospitals; working in military hospitals; and not willing to participate in the study. Data collection tool was a multi-part self-made questionnaire that covered all goals of the study. This question-

naire was designed based on the review of the literature, and its content validity was improved based on the judgment of 10 experts in the EBM field. To assess the internal consistency of the questionnaire, constructive inter-item correlation was assessed using Cronbach's alpha. The questionnaire reliability was assessed using test-retest, with at least 50 people ( $\alpha = 0.85$ ).

The questionnaire consisted of 2 main parts: the first part included demographic information (6 questions); the second part consisted of the main questions that respectively included an introduction to each EBM database (6 databases), familiarity with any of EBM terms (11 terms), feeling the need to improve EBM performance activities (4 activities), questions on knowledge and skills ( $n = 10$ ), and questions on attitude ( $n = 9$ ).

Sample size was calculated using a random sampling method by the predicted value equal to 0.5, accuracy of 0.02, and confidence level of 2. Finally, sample size was calculated to be 2500. Also, to prevent a decrease in the number of participants, the researchers added 10% to this population, and the final sample size was calculated to be 2800. To collect data, interviewers were used from selected provinces because they were familiar with the local language and customs of those provinces. To create consistency and common language among the interviewers, a workshop was held for them, and a pilot study with a sample size of at least 50 people was performed to ensure inter-rater reliability.

Ethical considerations in this study included the following: permission from the ethics committee of Iran University of Medical Sciences; coordination with the relevant authorities, hospitals, and universities; obtaining informed consent from participants; and preserving appropriate confidentiality of the information of the participants.

Descriptive statistics (mean  $\pm$  standard deviation), frequency distribution (number and percentage), independent samples t test and one-way ANOVA were used for data analysis using SPSS.16 software package. A p-value less than 5% was considered statistically significant.

## Results

From among 2800 questionnaires distributed, a total of 1524 questionnaires were completed and collected (response rate of 54.4%). The mean  $\pm$  SD age of the participants was  $31.2 \pm 7.2$  years. Most participants were females (51.6%). Nurses accounted for 53.8% of the participants. Most of the participants had a bachelor's degree (66.1%) and were working in the public sector (67.3%). Participants' demographic characteristics are presented in Table 1.

About 39% of the participants had low familiarity with the EBM databases, and only 12.7% were highly familiar with EBM databases (Table 2).

The results revealed that 39.5% of the participants had low familiarity with EBM terminology and only 15.8% were highly familiar with EBM terms (Table 3).

Most participants believed that EBM-related workshops and practical involvement in EBM-related programs and activities could have a great impact on the improvement of EBM performance. However, a small percentage of them

**Table 1.** Demographic characteristics of the participants

Variable	Variable level	Number (%)
Gender	Male	648 (42.5)
	Female	786 (51.6)
	Unknown	90 (5.9)
Job	Physician	330(21.7)
	Nurse	888 (53.8)
	Midwife	150 (9.8)
	Radiology technician	78 (5.1)
	Laboratory technician	66 (4.3)
	Other	6 (0.4)
	Unknown	6 (0.4)
Education	BS	1008 (66.1)
	Masters	108 (7.1)
	Ph.D.	36 (2.4)
	Professional doctorate	66 (4.3)
	Specialist	102 (6.7)
	Subspecialty	36 (2.4)
Work experience	1 to 5 years	324 (21.1)
	6 to 10 years	240 (15.7)
	11 to 15	120 (8)
	More than 15 years	90 (6)
	Unknown	750 (49.2)
Workplace	Public	1026 (67.3)
	Private	144 (9.4)
	Social security	132 (8.7)
	Public and private	180 (11.8)
	Public and social security	30 (2)
	Private and social Security	12 (0.8)

believed that EBM-related journal clubs could have a positive impact on the improvement of EBM-related activities (Table 4).

Most participants had a positive view towards EBM so that about 97% of them believed EBM will lead to better

clinical outcomes. Despite the positive attitude of the participants, about 75% acknowledged that EBM limits discretion of health care providers, and about 91% believed it is difficult to implement EBM due to the heavy workload and the large number of patients (Table 5).

**Table 2.** Familiarity with the EBM databases among participants (N= 1524)

Database	Low	Average	High	Unknow
Bandolier (published in Oxford)	468 (30.7)*	654 (42.5)	276 (18.1)	126 (8.3)
Evidence-Based Medicine(BMJ publishing group)	510 (33.5)	660 (43.3)	246 (16.1)	108 (7.1)
Effective Health Care Bulletins	570 (37.4)	648 (42.5)	186 (12.2)	120 (7.9)
Cochrane Database of Systematic Reviews	564 (37)	684 (44.9)	162 (10.6)	114 (7.5)
Database of Abstracts of Reviews of Effectiveness	750 (49.2)	504 (33.1)	150 (9.8)	120 (7.9)
Evidence-Based Purchasing	708 (46.5)	522 (34.4)	144 (9.4)	150 (9.8)
Total (%)	39	40.2	12.7	8

\*Number (%)

**Table 3.** Familiarity with the EBM terminology among participants (N=1524)

EBM Terminology	Low	Average	High	Unknow
Absolute risk	* 540(35.4)	552 (36.2)	324 (21.3)	108 (7.1)
Relative risk	486 (31.9)	690 (45.3)	264 (17.3)	84 (5.5)
Systematic review	510 (33.5)	660 (43.3)	276 (18.1)	78 (5.1)
Odds Ratio	666(43.7)	480 (31.5)	270 (17.7)	108 (7.1)
Likelihood ratio (LR)	690 (45.3)	474 (31.1)	240 (15.7)	120 (7.9)
Meta-analysis	594 (39)	606 (39.8)	210 (13.8)	114 (7.5)
Clinical effectiveness	588 (38.6)	636 (41.7)	228 (15)	72 (4.7)
Number needed to treat	474 (31.1)	648 (42.5)	282 (18.5)	120 (7.9)
Confidence interval (CI)	660 (43.3)	540 (35.4)	186 (12.2)	138 (9.1)
Heterogeneity	708 (46.5)	540 (35.4)	174 (11.4)	102 (6.7)
P-Value	714 (46.9)	456 (29.9)	204 (13.4)	150 (9.8)
Total (%)	39.5	37.4	15.8	7.1

\*Number (%)

**Table 4.** Participants belief about EBM improving activities (N=1524)

EBM improves activities	Unknow	High	Average	Low
EBM-related workshops	312 (20.5)*	660 (43.3)	462 (30.3)	90 (5.9)
Access to EBM-related resource	276 (18.1)	690 (45.3)	426 (28)	132 (8.6)
EBM-related journal clubs	348 (22.8)	678 (44.5)	330 (21.7)	168 (11)
practical participation in EBM-related programs and activities	234 (15.4)	672 (44.1)	486 (31.9)	132 (8.6)
Total (%)	19.2	44.3	27.975	8.575

\*Number (%)

Table 5. Study participants' attitudes towards EBM (N=1524)

Databases	Totally agree	Somewhat agree	No idea	Disagree	Totally disagree	Unknown
EBM will lead to better clinical outcomes.	714 (46.9)*	756 (49.6)	6 (0.4)	18 (1.2)	0	30 (2)
EBM reduces the cost of the health system.	606 (39.8)	816 (53.5)	0	72 (4.7)	0	30 (2)
EBM is essential for all health service providers.	528 (34.6)	858 (56.3)	6 (0.4)	102 (6.7)	0	30 (2)
There is no obstacle in applying EBM for all patients.	408 (26.8)	732 (48)	18 (1.2)	318 (20.9)	18 (1.2)	30 (2)
EBM does not consider patient's preferences and values.	318 (20.9)	642 (42.1)	18 (1.2)	510 (33.5)	6 (0.4)	30 (2)
EBM limits discretion of health care providers.	348 (22.8)	654 (52.9)	0	468 (30.7)	24 (1.6)	30 (2)
It is difficult to implement EBM due to heavy workload and high number of patients.	618 (40.6)	762 (50)	12 (0.8)	90 (5.9)	12 (0.8)	30 (2)
EBM is a waste of time.	288 (18.9)	696 (45.7)	0	450 (29.5)	60 (3.9)	30 (2)
Despite the large volume of scientific papers in the field of medicine, a very small amount of this information can be used in EBM.	516 (33.9)	762 (50)	12 (0.8)	180 (11.8)	24 (1.6)	30 (2)

\*Number (%)

Table 6. Participants' level of knowledge and skills on EBM(N=1524)

Knowledge and skills on EBM	Very high	High	Average	Low	Very low	Unknown
Converting your work-related issues and problems into a specific research question	336 (22)*	534 (35)	492 (32.3)	90 (5.9)	36 (2.4)	36 (2.4)
Searching databases to extract needed articles and information	318 (20.9)	510 (33.5)	504 (33.1)	114 (7.5)	36 (2.4)	42 (2.8)
Ability to design a study	192 (12.6)	534 (35)	462 (30.3)	234 (15.4)	48 (3.1)	54 (3.5)
Meeting sample size for your study	234 (15.4)	366 (24)	515 (33.9)	270 (17.7)	96 (6.3)	42 (2.8)
Performing statistical tests	192 (12.6)	330 (21.7)	552 (36.2)	300 (19.7)	114 (7.5)	36 (2.4)
Writing an article	204 (13.4)	366 (24)	510 (33.5)	294 (19.3)	108 (7.1)	42 (2.8)
Assessment of biases in articles	174 (11.4)	396 (26)	486 (31.9)	300 (19.7)	132 (8.7)	36 (2.4)
Critical assessment of articles	198 (13)	396 (26)	498 (32.7)	318 (20.9)	78 (5.1)	36 (2.4)
Using research findings in your field	252 (16.5)	594 (39)	462 (30.3)	138 (9.1)	36 (2.4)	42 (2.8)
Transferring and exchanging information with your colleagues	360 (23.6)	618 (40.6)	436 (28.7)	72 (4.7)	0	36 (2.4)
Total (%)	16.1	31.2	32.1	13.9	4.5	2.6

\*Number (%)

About 47% of the participants reported that their knowledge and skills on EBM was high and very high. Also, about 32% and 18% of them reported that their level of knowledge and skills was average and low, or very low, respectively (Table 6).

Among the demographic variables, there were significant relationships between work experience and attitude, gender and attitude, and between knowledge and skills ( $p < 0.05$ ).

## Discussion

Results of the present study revealed that 39% of the participants had low familiarity with the EBM databases and only 12.7% were highly familiar with these databases. Of the participants, 39.5% had low familiarity with EBM terms and only 15.8% were highly familiar with these terms. Most participants believed that EBM-related workshops and practical participation in EBM-related programs and activities could have a positive impact on the improvement of EBM-related activities. Most participants had a positive view towards the EBM so that about 97% of the participants believed EBM will lead to better clinical outcomes. Participants' knowledge and skills on EBM is relatively high so that about 47% of them reported that level of their knowledge and skills on EBM is very high and high.

The results revealed that health service providers have relatively low knowledge of terms and proprietary databases of EBM. The lowest familiarity and understanding relate to heterogeneity, confidence interval, and odds ratio, which is largely consistent with the results of previous

studies (31-33). In the current study, participants' awareness of some of the terms such as absolute risk and systematic review was high compared to other terms, and this might have been due to the literal meanings of these terms because they seem to have simple meanings, but they have complicated meanings and concepts statistically and methodologically that need to be investigated further. In general, the results of awareness and understanding of EBM specific terms indicate that the health care providers' level of knowledge about statistical and methodological terms is less compared with practical terms in the workplace. Hence, it is recommended to train the health care providers about statistical and methodological issues to empower them to use and implement EBM. According to previous studies in Iran, a systematic training program increased the participants' skills on EBM (34, 35) thus, there is a need for careful theoretical and practical planning in different aspects to increase individuals' familiarity with EBM including participation in workshops and training courses, journal clubs and the grand rounds, conferences, seminars, and meetings. Therefore, it seems essential to develop an appropriate and comprehensive training curriculum in the field of EBM in universities of medical sciences in Iran in the future.

The present study revealed that health care providers' perspective about EBM in Iran is relatively positive. The result of Parvin et al.'s study reflected the attitude of most nurses towards evidence-based nursing such as Egerod and Hansen's research results (36, 37), while in Koehn & Lehman, study, participants had a moderate attitude towards evidence-based cares and there was a significant



difference between attitudes of undergraduate and graduate nurses (38). In Aghahoseini study, most nurses had apathetic attitude towards evidence-based nursing, and there was a significant relationship between nurses' attitudes and age (39). In a study, Lai et al. reported that physicians had a positive attitude, but nurses and health care providers had a negative attitude towards evidence-based cares (40). A positive attitude towards evidence-based care can pave the ground for starting and raising awareness of evidence-based practice, and it seems that information exchange and interaction among all health care providers in health care centers can provide a suitable ground for the application of EBM. Most of the participants believed that EBM-related workshops and practical participation EBM-related programs and activities can have a great effect on the improvement of EBM-related activities, which is consistent with most previous studies abroad (5, 41-52). Thus, according to the results of this study and almost identical results in other studies, fulfilling the foregoing can have a large impact on improving the quality of EBM activities in Iran. The interesting point was that most participants in the present study acknowledged that journal clubs cannot have a large impact on improving the quality of EBM activities, which may be due to low quality and type of journal clubs, which are held in the form of lectures. In this regard, Shokouhi et al. (2012) found that the design of evidence-based journal club, compared to the current Journal clubs, has a better effect on assistants' consent (53). Thus, it seems that the effectiveness of journal clubs in the performance of EBM is enhanced by changing the manner of holding these clubs and improving their effectiveness using the available evidence (54).

Although the present study has been conducted on a large scale and with the large number of participants from different health care providers and included many dimensions of EBM, the main limitation of this study was the large number of lack of responses from the participants, especially physicians. Also, despite trained interviewers and a pilot study to achieve consistency between the participants, due to varying conditions of the hospitals in different cities, the researchers were worried about using the same procedure for data collection and data entry in different cities.

### Conclusion

Results of the present study revealed that individuals' knowledge of EBM databases and terms was relatively low, while they had relatively high knowledge and skills. Health care providers' attitude towards EBM in Iran's hospitals was positive. According to the results, it seems that holding EBM-related workshops and practical participation in EBM-related programs and activities as well as improving facilities such as manpower, equipment, space, and access can have a significant effect on improving EBM-related activities.

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### Conflict of Interests

The authors declare that they have no competing interests.

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