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Evidence-based medicine among health-care workers in hospitals in Iran: A nationwide survey

Ahmad Moosavi¹, Alireza Sadeghpour², Saber Azami-Aghdash³, Naser Derakhshani⁴, Mohammad Mohseni⁵, Dariush Jafarzadeh⁶, Aziz Rezapour⁴

¹Department of Health and Community Medicine, Dezful University of Medical Sciences, Dezful, Iran, ²Department of Orthopedic Surgery, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran, ³Tabriz Health Services Management Research Center, Health Management and Safety Promotion Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran, ⁴Health Management and Economics Research Center, Iran University of Medical Sciences, Tehran, Iran, ⁵Health Services Management Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran, ⁶Iranian Center of Excellence in Health Management, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran

Address for correspondence:

Dr. Aziz Rezapour, Health Management and Economics Research Center, Iran University of Medical Sciences, Tehran, Iran.
E-mail: rezapoor_a57@yahoo.com

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Abstract:

BACKGROUND: Evidence-based medicine (EBM) plays an important and dominant role in promoting effective decision-making in the health system. This study was aimed to evaluate the EBM performance among health-care workers (HCWs) in hospitals in Iran.

METHODS: In this study (a cross-sectional study), participants were 2800 HCWs in hospitals. A researcher-made questionnaire was designed, and judgments of 10 experts were used for the improvement of content validity. The reliability of the questionnaire was assessed by the test-retest method ($\alpha = 0.85$). Data were analyzed using the descriptive statistics, *t*-test, and one-way ANOVA, in SPSS.16 software.

RESULTS: Eventually, 1524 questionnaires were completed (response rate: 54.4%). The results of the study show that 62% of participants have not accessed scientific journals, 52% of them have difficulties using the Internet at work, guidelines were not reachable for 76% of them, and about 80% have not access to databases. About 39% of participants were not well informed about databases of EBM, and 15.8% of them were immensely knowledgeable about EBM terminology. The most important problems to increase HCWs information about EBM include research methodology- related problems, lack of resources and motivation, and coordination problems. The most prominent facilitators include: providing training courses in EBM and increased facilities. Only work experience showed a significant correlation with barriers and facilitators, and gender revealed a significant correlation with barriers ($P < 0.05$).

CONCLUSION: It seems that prioritizing the increased access to information resources and databases, considering the research skills of the HCWs, extending the opportunities and increasing the facilities such as workforce, equipment, physical environment, and accessibility can have a great impact on the improvement of the activities associated with EBM.

Keywords:

Barriers, evidence-based medicine, facilitators, health care workers, hospitals

Introduction

Nowadays, the increasing awareness, practical researches, and expectations of health systems have made the health systems constantly thinking about enhancing the quality of healthcare.^[1-3] Health systems try to improve the quality of health services by formulating valid guidelines and standards and comparing their performance with it,^[4]

and also, using results of the researches in the clinical practice is a way to expand the scientific basis and knowledge of experts in this field.^[5,6] Hence that Krugman believes that the use of research results can remove the traditional and uncertain practice and by replacing it with safe and reliable care will lead to the improvement of the health-care standards and quality of provided services by health-care professionals.^[7,8] Therefore,

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the realization of best practice to ensure the clinical effectiveness of health-care services needs to access the best evidence for “evidence-based decision-making.” Hence, health-care workers (HCWs) are showing a tendency toward evidence-based medicine (EBM).^[9-11]

According to some authors, EBM has been noticed since the French Revolution in Paris for the first time, and some others would say that they have found its earlier roots in Chinese medicine. EBM is a set of abilities and skills in using and integrating the best evidence, which is achieved from repeatable and without bias clinical trials with the patient’s preferences and conditions^[12,13] The most common definition of EBM is provided by Dr. David Sackett. EBM is “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research.”^[14]

Along with presenting and considering EBM in various fields, many studies have been performed around the world to evaluate the knowledge, attitude, and behavior in the field of EBM,^[13,15,16] its barriers and facilitators,^[17-25] understanding and perception of the concept of EBM,^[26-32] and its other aspects.

During the past few years, EBM is also considered in many areas of Medical Sciences in Iran.^[33,34] Conducted Studies in Iran have shown that the knowledge, attitude, and behavior of different groups of HCWs is low in this subject.^[35,36]

Furthermore, consideration of the EBM in the health system can be useful for both staff and patients. Because identifying staff weaknesses in this area as well as identifying the gap in the country can be a guide for policymakers in choosing the policies needed in future. Given the importance of EBM, the acquisition of comprehensive and transparent information about the status of EBM among HCWs in hospitals can play an important role in promoting EBM. Therefore, this study was aimed to provide a comprehensive review of the status of EBM among HCWs in hospitals in Iran.

Methods

This study is a cross-sectional study which was conducted in 2018. The participants were all HCWs (physicians, nurses, midwives, and staff working in diagnostic units) in hospitals in Iran. To select the studied hospitals, 7 provinces were selected by simple random sampling among all the provinces of Iran. In each of the selected provinces, 5 hospitals were chosen randomly in the provincial capitals. Then, in the next stage of the research,

80 HCWs had been chosen and entered the study by quota sampling.

Exclusion criteria included: work experience <1 year, employment in administrative and managerial units (only those who were directly involved in providing services to patients), people who were working in hospitals and were also studying in the universities at the same time, people working in military hospitals and individuals who had not consented to participate in the research study. The data collection tool was a researcher-made questionnaire which has covered all the objectives of the study. The questionnaire was designed based on the literature review, and judgments of 10 experts were used for the improvement of the content validity of it. To assess the internal consistency of the questionnaire, the correlation between the questionnaire items was assessed by using the Cronbach’s alpha, and the reliability of the questionnaire was assessed by using the test-retest reliability method with the contribution of 50 participants ($\alpha = 0.85$).^[36-38]

The questionnaire consisted of two main parts: the first part related to the demographic information (6 questions), the second part of the main questions, respectively, included: Accessibility to the EBM databases (6 databases), familiarity with each of the EBM databases (6 databases), familiarity with any of the EBM terms (11 terms), information resources of EBM (4 sources), requiring performance improvement activities (4 activities), questions about barriers (15 questions), and questions related to the facilitators of EBM (6 questions).

In this study, the following formula was used to estimate the sample size.

$$n = \frac{Z^2 p(1-p)}{d^2}$$

In this formula, the confidence interval (CI) (Z) was equal to 2 and the foreseen average in the community (p) was considered equal to 0.5 because the investigators wanted to have the largest sample size for the study and also the accuracy of 0.02 was used. According to the above formula, the sample size was calculated to be 2500. To raise the accuracy of the study and also preventing a significant decrease in the number of the study participants, the sample size was increased by 10%, and finally, the ultimate sample size was equivalent to 2800. To collect data, some interviewers were chosen from selected provinces who were accustomed to the local language and customs of the people of those provinces. To collect data, some interviewers were chosen from selected provinces who were accustomed to the local language and customs of the people of those provinces. To create consistency and

a common language between interviewers, a briefing had been held for interviewers and also a pilot study was conducted with a sample size of at least 50 people to ensure the inter-rater reliability.

The collected data have been reported by using descriptive statistics (frequency, percentage, mean, and standard deviation), *t*-test, one-way ANOVA, and have been analyzed by using the SPSS.16 software (version 16, SPSS Inc., Chicago, IL). In this study, the $P \leq 5\%$ was considered statistically significant.

Ethical considerations in this study included: permission from the Ethics Committee of the Iran University of Medical Sciences, coordinating with the authorities of the relevant hospitals and universities, obtaining informed consent from participants and ensuring the confidentiality of the information and profiles of the participants.

Results

Eventually, 1524 questionnaires were completed and collected from 2800 distributed questionnaires (response rate: 54.4%). The mean and standard deviation of the participants' age was 7.2 ± 31.2 . The demographic characteristics of the participants are presented in Table 1.

Table 1: Demographic characteristics of the health-care workers in hospitals of Iran

Variable	Variable level	n (%)
Sex	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)
	Lab technician	66 (4.3)
	Other	6 (0.4)
	Unknown	6 (0.4)
	Education	Bachelors
Masters		108 (7.1)
PhD		36 (2.4)
Physician		66 (4.3)
Specialist		102 (6.7)
Fellowship		36 (2.4)
Work experience	1–5 years	324 (21.1)
	6–10 years	240 (15.7)
	11–15	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)

The results indicated that about 62% of participants have not accessed to scientific journals, 52% of them have difficulties to use the Internet at work, guidelines were not reachable for 76% of them, and about 80%, 38.6%, and 19.3% have not, respectively, accessed to databases, libraries, and the Internet. About 39% of participants were not well informed about databases of EBM and only 12.7% of participants were remarkably cultivated and knowledgeable about databases of EBM. Only about 10% of the participants were very familiar with bases Cochrane Database of Systematic Reviews, Database of Effective Health, and Abstracts of Reviews of Effectiveness Care Bulletins. About 39% of participants were not well informed about databases of EBM and 15.8% of them were immensely knowledgeable about EBM terminology.

About 39% of participants were not well informed about databases of EBM and 15.8% of them were immensely knowledgeable about EBM terminology. The knowledge of the participants about some terminologies such as meta-analysis, CI, heterogeneity, and the *P* value was at a low level. The participants were more familiar with the terminologies of the systematic review, relative risk, absolute risk, and number needed to treat.

More than half of the participants (55.5%) had not used articles as the information sources for EBM. About 64% of the participants were using textbooks, and about 61% of them had not used professors and experts as EBM sources. About 80% of the study participants had used the Internet as the information sources for EBM.

About two-thirds of the participants believed that practical contributions in programs and activities related to EBM and conducting EBM workshops can have a great impact on the improvement of activities related to EBM. A few percent believed that accessibility to the information sources of EBM and holding journal clubs associated with EBM can have a great effect on the improvement of activities related to EBM.

The results about EBM barriers from the viewpoint of the study participants are shown in Table 2. Nearly 90% of the participants agreed with referred barriers in Table 2 as the EBM barriers in the Iranian hospitals (strongly agree + somewhat agree). Only about 8% of the participants did not agree with these barriers as the inhibitors of EBM in Iranian hospitals. The participants mostly agreed on the barriers, which include the following: difficulties associated with research (unrelated to the clinical issues, nontransparent results, nongeneralized results), lack resources (lack of physical environment, equipment, and the enormous number of patients), lack of motivation (lack of motivation to increase knowledge and use of information

Table 2: Evidence-based medicine barriers from the perspective of health-care workers in hospitals of Iran

Databases	Completely agree, n (%)	Somewhat agree, n (%)	No idea, n (%)	Disagree, n (%)	Completely disagree, n (%)	Unknown, n (%)
Problems associated with research (unrelated to the clinical issues, nontransparent results, nongeneralized results)	786 (51.6)	690 (45.3)	0	24 (1.6)	0	24 (1.6)
lack of resources (lack of physical environment, equipment, and the enormous number of patients)	780 (51.2)	648 (42.5)	0	72 (4.7)	0	24 (1.6)
The time limitation (for searching information sources, reviewing the research findings, the time limitation for the deployment and applying the results)	720 (47.2)	660 (43.3)	18 (1.2)	102 (6.7)	0	24 (1.6)
Lack of skills (search skills, reading, assessment of articles, understanding and interpreting the other languages)	630 (41.3)	606 (39.8)	0	240 (15.7)	24 (1.6)	24 (1.6)
Accessibility restrictions (to information, library...)	678 (44.5)	600 (39.4)	6 (0.4)	204 (13.4)	12 (0.8)	24 (1.6)
Financial difficulties (lack of financial resources for change, evidence-based performance expenditures...)	750 (49.2)	612 (40.2)	6 (0.4)	126 (8.3)	0	30 (2)
Lack of training (lack of training about the design of the research question, and using the results of studies)	810 (53.1)	576 (37.8)	6 (0.4)	90 (5.9)	12 (0.8)	30 (2)
Coordination problems (coordination with colleagues, coordination with managers and authorities, poor teamwork)	744 (48.8)	648 (42.5)	0	84 (5.5)	18 (1.2)	30 (2)
Negative attitude (to EBM and its achievements)	672 (44.1)	648 (42.5)	6 (0.4)	156 (10.2)	12 (0.8)	30 (2)
lack of motivation (lack of motivation to increase knowledge and use of information and lack of public service motivation)	762 (50)	600 (39.4)	0	126 (8.3)	6 (0.4)	30 (2)
Lack of support (from the managers and the organization, from colleagues and patients)	738 (48.4)	666 (43.7)	0	72 (4.7)	18 (1.2)	30 (2)
Change problems (change challenges in current practice, lack of resources for change, resistance to change)	624 (40.9)	762 (50)	12 (0.8)	102 (6.7)	0	24 (1.6)
Lack of priority setting (overlooking the health care providers, managers and authorities)	702 (46.1)	618 (40.6)	6 (0.4)	144 (9.4)	30 (2)	24 (1.6)
Patient-related barriers (unreasonable demands of patients, patients' cultural and social differences,...)	702 (46.1)	654 (42.9)	0	132 (7.8)	12 (0.8)	24 (1.6)
Legal barriers (legal restrictions and lack of freedom of action, lack of structure and clear instructions)	720 (47.2)	660 (43.3)	12 (0.8)	90 (5.9)	18 (1.2)	24 (1.6)
Total average (%)	47.3	42.2	0.3	7.7	0.7	1.7

EBM=Evidence-based medicine

and lack of public service motivation), and coordination problems (coordination with colleagues, coordination with managers and authorities, poor teamwork).

The results about EBM facilitators from the viewpoint of the study participants are shown in Table 3. Nearly 93% of the participants agreed with referred facilitators in Table 3 as the EBM facilitators in the Iranian hospitals (strongly agree + somewhat agree). Only about 5% of the participants did not agree with these facilitators as the facilitators of EBM in Iranian hospitals. The participants mostly agreed upon the facilitators, which include the following: conducting EBM workshops (research methodologies, search skills, assessment of articles quality), improving facilities such as human resources, physical environment, space, and accessibility).

Results of the statistical tests indicated that from among all the demographic variables, only work experience showed a significant correlation with barriers and facilitators and gender revealed a significant correlation with barriers ($P < 0.05$).

Discussion

The results demonstrated that most of the participants have not accessed to scientific journals, most of them have difficulties to use the Internet at work. Guidelines and databases were not reachable for the majority of participants. The most dominant barriers to EBM include problems associated with research, lack of resources, and lack of motivation and coordination problems. The most prominent facilitators include: providing training courses in EBM and increased facilities. Results of the statistical tests revealed that from among all the demographic variables, only work experience showed a significant correlation with barriers and facilitators, and gender revealed a significant correlation with barriers.

As mentioned before, most of the participants had limited access to EBM resources. This result was consistent with earlier studies in Iran.^[39-46] Therefore, given the importance of the availability of resources in motivating the HCWs and thereby improving EBM, health authorities and managers should plan and take the necessary steps to provide access to EBM resources.

Table 3: Evidence-based medicine facilitators from the perspective of health care workers in hospitals of Iran

Databases	Completely agree, n (%)	Somewhat agree, n (%)	No idea, n (%)	Disagree	Completely disagree, n (%)	Unknown, n (%)
Conducting EBM workshops (research methodologies, search skills, assessment of articles quality)	870 (57.1)	576 (37.8)	0	36 (2.4)	6 (0.4)	36 (2.4)
Increasing facilities such as human resources, physical environment, space, and accessibility)	738 (48.4)	678 (44.5)	0	72 (4.7)	0	36 (2.4)
Providing access to the information resources, results of the conducted studies and the Internet	804 (52.8)	606 (39.8)	0	72 (4.7)	0	36 (2.4)
Providing consultations on research methodologies and EBM	750 (49.2)	648 (42.5)	0	78 (5.1)	12 (0.8)	36 (2.4)
Removing legal barriers to EBM	810 (53.1)	582 (38.2)	0	90 (5.9)	6 (0.4)	36 (2.4)
Broadening supports for EBM	804 (52.8)	606 (39.8)	0	66 (4.3)	12 (0.8)	36 (2.4)
Total average (%)	52.2	40.4	0	4.5	0.4	2.4

EBM=Evidence-based medicine

The results demonstrated that awareness of the HCWs in Iran about the EBM terminologies and databases is at a low level. The least level of acquaintance and understanding in the field of the EBM terminologies is related to the terms of heterogeneity, CI, and odds ratio (Odd Ratio), which largely coincided with the results of previous studies.^[47-49] In this study, the participants' awareness of some of the terms like absolute risk and Systematic Review was higher than the other terms that may be caused by the literal meanings of these terms, because it seems that these terms have a simple and comprehensible denotation, but they have complicated and sophisticated definitions statistically and methodologically and this issue should be deliberated more precisely. Wholly, the results of understanding and perceiving the EBM expressions and terminologies indicated that the knowledge and awareness of the health care providers in the field of statistical and methodological expressions are lower than the practical expressions in the workplace. Hence, the need to provide the training in the field of the statistical and methodological issues for the HCWs is noticeable to promote the implementation of EBM. According to the other studies in this context, the skills of participants in EBM have increased after a precise and exquisite training program,^[50,51] so a detailed and exact theoretical and practical planning with different methods is required for increasing the familiarity of the HCWs with EBM, including participation in workshops and training courses, journal clubs and the grand rounds, conferences, seminars, meetings, and gatherings, etc., Therefore, the necessity of developing an appropriate and comprehensive training curriculum in the field of EBM in the universities of medical sciences should be considered in future.

In the present study, the Internet and reference books were the best sources of information for the participants. However, several sources noted that books cannot be updated and suitable resources for finding evidence of clinical decision making, due to the fast development of medical sciences.^[52,53] In a study conducted in Malaysia on interns, it was reported

that the first reference of acquiescing information was asking the other people (colleagues, professors, and medical staff) for >60% of the study participants.^[54] In a study on residents of the Wisconsin University of medical sciences of the United States of America, it was found that 100% of the participants in the research had used Up to Date database, and >70% of them had used Medline to access the information in 1 month before the study.^[55] According to the findings of this study, papers and magazines had the least application. While in a study by Oliveri RS *et al.*^[56] in Germany papers and magazines were the main source of information. Due to the limited and out of date information of the reference books^[57] taking advantage of papers and magazines is recommended. Due to the low rate of making use of papers which can be resulted from lack of reading skills due to lack of English proficiency, lack of perceiving and understanding the results due to unfamiliarity with research and methodological issues or having poor access to articles, reviewing and removing these barriers and other possible barriers to EBM is essential.

The present study revealed that the most important barriers to EBM are related to the research problems, lack of resources, time limitations, and lack of education. This finding is consistent with most foreign studies.^[13,16,42,58-69] The results of the other reported studies demonstrated that lack of time and an enormous number of patients are the main barriers to the nurses for the use of research evidence in the health-care services.^[70,71] Another study has also indicated that the main recognized barriers in this field are the lack of time and lack of skills in implementing EBM.^[72] Results of other studies have confirmed that lack of facilities, lack of enough time for studying results and findings of other articles and the lack of support from management systems in both educational and clinical levels are major barriers to EBM^[73,74] which are consistent with our findings. It seems that managers should also notice the importance and benefits of EBM, and should take steps to provide the hardware and software facilities and plan and implement the necessary training to

overcome these barriers. According to the study participants' viewpoints, conducting workshops, and training courses in EBM (research methods, search, and assessment of papers quality) and increased facilities such as human resources, equipment, physical environment, and accessibility are considered as the most important facilitators to EBM. As well as barriers to EBM, these findings are also consistent with the results of the foreign studies.^[13,75-86] Therefore, according to the results of the current study and almost the same obtained results in other studies, providing appropriate facilities to implement the EBM, providing sufficient time for study and acting based on evidence through reducing the workload, enhancing human resources, teaching the time management, providing training in the fundamentals of research methodology and designing, conducting and taking advantage of research results as well as presenting training courses in the principles and standards of EBM and providing the legal, political, and administrative infrastructures for change and making use of research results by the service providers, of course, by monitoring the professional, ethical and legal principles, and also presenting solutions and incentives to boost medical cooperation in the field of EBM and conducting workshops and training courses for HCWs to increase their English proficiency in order to develop the success of the EBM seems inevitable.

Although this study was conducted on a large scale with the enormous number of participants from different kinds of HCWs and large-scale has also included the EBM topics, the impossibility of controlling the controversial nature of the EBM,^[87,88] which can affect the results of the present study, is the main limitation of this study.

Conclusion

Results of the present study revealed that HCWs in the hospitals of Iran have limited access to EBM information sources. The knowledge of the HCWs from EBM terminologies and databases is relatively low. HCWs face many barriers in the field of EBM. According to the results of the present study in the field of the facilitators and the need for improvement activities, it seems that conducting workshops related to the EBM, practical participation in programs and activities related to the EBM and increasing resources and facilities such as human resources, equipment, physical environment, and accessibility can have a great impact on the improvement of related activities to the EBM.

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Conflicts of interest

There are no conflicts of interest.

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