

Original Article



Barriers to Implementation and Application of Evidence-Based Medicine from the Viewpoints of Clinical Residents

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Article history:

Received: September 19, 2023

Revised: September 28, 2023

Accepted: October 6, 2023

ePublished: October 15, 2023

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Abstract

Background: Nowadays, evidence-based medicine (EBM) is considered a rational framework for decision-making in medicine and its skill training. Thus, the present study aimed to determine the barriers to the execution and application of EBM.

Methods: In this cross-sectional survey study, 99 clinical assistants of Hamadan University of Medical Sciences in Iran were randomly assigned to the study. Data were collected using a questionnaire, including background information and information related to barriers in 5 areas, and then analyzed by SPSS-22.

Results: Overall, 66.7% of the clinical assistants identified spending a long time to justify the patient to implement EBM, and 61.6% identified the lack of trained people for evidence-based care, the absence of monitoring mechanisms, and the follow-up of EBM in education and treatment. In addition, 60.6% identified new evidence-based medical devices and the lack of knowledge of many doctors in this category as the most serious obstacles. The highest and lowest average barriers were obtained concerning the health system managers (76.30) and librarians and medical informants (64.27), respectively.

Conclusion: Notwithstanding that the assistants consider EBM effective in treating patients; the lack of training in the skills associated with this category and the lack of attention of health system managers have prevented the utilization of EBM in practice. Accordingly, eliminating the barriers associated with managers can be the most important step in the development of EBM.

Keywords: Evidence-based medicine, Physician assistants, Hamadan University of Medical Sciences

Please cite this article as follows: Vakilmofrad H, Hosseinirad S. Barriers to implementation and application of evidence-based medicine from the viewpoints of clinical residents. *Avicenna J Care Health Oper Room*. 2023; 1(2):52-60. doi:10.34172/ajchor.27

Introduction

The advancement of information technology and its impact on medical information, as well as the abundance of data from biomedical research, have led to the emergence of evidence-based medicine (EBM). This paradigm provides a rational framework for making the best scientific decisions to improve the quality of medical services (1). EBM refers to the appropriate and informed use of the most up-to-date evidence in clinical decision-making for the care of patients (2). Its greatest benefit lies in the use of the best available evidence from clinical practice, health services, and decision-making (3).

Since the introduction of EBM, its philosophy and practice have significantly improved the quality of healthcare and the skills and knowledge of physicians. This is due to the rapid growth of updated and validated information in diagnostic and therapeutic areas. Additionally, it facilitates better communication between

patients and physicians regarding the reasoning behind clinical decisions. However, practicing physicians, clinical trainers, and trainees often face challenges in translating the existing evidence into practice (4).

The Accreditation of Medical Education Graduates Association identifies six main merits of EBM for residents' education, one of the most important of which is "expediency-based development" (5). EBM is a powerful tool to reduce errors caused by mental judgment, outdated information, or biased medical knowledge. It involves using credible and up-to-date evidence to inform clinical decisions (6). This approach helps bridge the gap between theory and practice in medicine, providing an effective educational strategy for students and lifelong learners. By relying on EBM, we can strive for the highest quality of medical care (7).

Having access to up-to-date information in the medical profession has a significant impact on patient treatment.



The medical staff firmly believes that the healthcare environment is always associated with unpredictable issues and uncertainty-based decisions. Timely access to information in medical resources can prevent mistakes and promote better healthcare. In other words, the difference between correct clinical practice and a dangerous medical error can often be attributed to having access to up-to-date information (8,9). EBM brings various benefits, both in terms of quantitative and qualitative improvements of products and services, as well as in the prevention of work-related accidents. It also leads to increased organizational stability and a reduced need for supervision, resulting in stronger employee morale, professional pride, and cost savings (10). According to the American Medical Association, 90% of healthcare decision-making in 2020 will be evidence-based (11). Ultimately, EBM leads to better quality of work for physicians and nurses and higher satisfaction levels for society.

Entering clinical research results has always been a challenge for applying evidence in healthcare (12). In recent years, there have been significant efforts to develop evidence-based education in medical and clinical sciences while focusing on optimal clinical decision-making and improving patient outcomes. Various studies have highlighted different ways in which the education and empowerment of residents, general medical students, and physicians are being implemented worldwide. While these trainings have proven to have positive effects on learners' knowledge and attitudes (6,13), in some cases, they have failed to sustainably and institutionally impact the clinical behaviors of students, residents, or physicians.

The results of studies indicate that attitudinal, cultural, financial, and opportunity barriers hinder the use of EBM in clinical settings (14-16). Several studies have shown that barriers to the use of EBM include financial and equipment limitations (7), insufficient investment by health system managers, and a lack of material and spiritual support for physicians who are new to the concept of EBM (17). Although there is a growing trend towards adopting EBM to improve patient care, make clinical decisions, and reduce treatment costs, custodians in this area continue to lack the necessary support and investment to implement it. Additionally, physicians often disregard the importance of incorporating EBM into their practice, which is a significant issue (17,18).

Based on the literature review, it is evident that in the past decade, there has been considerable attention given to the development of the concept of EBM and the effectiveness of the courses provided in this regard. In the universities of the country, the focus on EBM has been mainly on the quality of care and the level of education for healthcare and medical students, particularly after 2012 (6). Residents play a significant role in providing healthcare services, as they are often the first point of contact for patients with public health service providers. They are responsible for using evidence-based medical concepts in their day-to-day activities and clinical decisions, which ultimately results in

better patient outcomes (19). However, some studies have reported that physicians face barriers to practicing EBM (20). Identifying barriers from residents' perspectives is crucial to finding solutions. However, few studies have been conducted in this area (21,22). Therefore, this study sought to identify and investigate the barriers that exist to implementing EBM in Hamadan hospitals. It is expected that hospitalization time will be reduced and the performance of residents will be improved by addressing these barriers through proper planning and development.

Materials and Methods

The present study has been performed through a descriptive-analytic scintillation study at Hamadan University of Medical Sciences in educational hospitals (Be'sat, Fatemiyeh, Farshchian, Beheshti, and Sina). The statistical population of this study included all the residents studying at Hamadan University of Medical Sciences. The sample size was calculated for 101 people according to the previous study (23) and considering the confidence coefficient of 0.95, accuracy of 0.01, $P=0.67$, and a fall of 20%. The data have been collected by a questionnaire, and the validity of the questionnaire has been confirmed by the opinions of the professors and relevant experts. The reliability of the questionnaire has been calculated and approved in the population by the responses of the first 30 questionnaires and using Cronbach's alpha of 0.906. The questionnaire consists of two sections; the first part is related to demographic information, and the second part contains 45 questions about the barriers to using EBM in clinical settings concerning physicians, patients, evidence, health system managers, librarians, and information scientists, with 14, 5, 7, 11, and 8 questions, respectively. The collected data at the descriptive statistics level were analyzed by the SPSS software, version 22. The data regarding the views of each person in the study on each question (barriers) were collected using the five options 'I agree very much', 'I agree', 'I have no idea', 'I disagree', and 'I disagree strongly' (Likert-type scale), and the score of the questionnaire areas was calculated based on a scale of 0 to 100.

Results

Out of 101 distributed questionnaires, 99 cases were completed and returned. The results of the analysis of the questionnaires demonstrated that 43.4% of the participants were females, the rest were males, and 29.3% of the subjects were between the age range of 30 and 35 years old. Among the assistants in this research, the highest frequency was observed in Obstetrics and gynecology assistants (20.2%), while emergency medicine assistants had the lowest frequency (2%). Almost half of the participants in the study (45.5%) stated that they had a moderate familiarity with the category of EBM, and a few (4%) reported very little familiarity. Most of the study participants (67.7%) did not participate in EBM workshops. Nearly half of the 45 (45.5%) residents reported the impact of EBM on

improving patients and expediting the treatment process at moderate rates.

According to the results of Table 1, the highest frequency (61.6%) was related to the item “lack of trained people for the use of evidence-based research findings”, and 50% of the subjects stated that the “lack of trained people for the use of research findings in evidence-based care” (61.6%), “this approach is not common among other colleagues and in clinical settings, only looking at a course” (57.6%), “the expectations of professors and physicians are based on reference books, not evidence-based” (56.6%), “we do not have sufficient skill in using it” (56.1), “the newness of the EBM category and the need to learn new marches in this field” (55.6%), “different attitudes of other colleagues to EBM” (52.5%), and “lack of the ability and skill to search, review, and evaluate evidence and documentation” (50.5%) were among the most important barriers to the use of EBM concerning physicians.

Based on the findings of Table 2, the most frequent items related to “many problems with the use of EBM for the treatment of patients who choose not to choose the best option” (66.7%), “a lot of time to justify the patient to perform EBM” (66.7%), and “incorrect medical information that some people get through the media” (54.5%), and more than 50% of the subjects referred to these three criteria as the most important barriers to EBM which were in line with patients.

According to the results of Table 3, the highest frequency was associated with “the novelty of the subject and the lack of knowledge of many physicians” (60.6%), “the lack of access to some existing evidence” (58.6%), and the “high volume of medical information” (52.5%). “More than 50% of the subjects considered the three mentioned items as the most important barriers to the use of EBM.

The results (Table 4) further revealed that the most frequent barriers (61.6%) were the “lack of complementary

Table 1. Barriers of Using Evidence-based Medicine in Clinical Settings Concerning Physicians

Barriers	I Quite Agree	I Agree	No Comments	I Disagree	I Quite Disagree
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Different attitudes of other colleagues to EBM	13 (13.1)	52 (52.5)	23 (23.2)	11 (11.1)	0 (0)
Fear of confrontation with EBM	8 (8.1)	30 (30.3)	35 (35.4)	26 (26.3)	0 (0)
Applicability of EMB for academics, not general practitioners	7 (7.1)	33 (33.3)	30 (30.3)	29 (29.3)	0 (0)
The vague role of history and clinical examination in the field of EBM	8 (8.1)	26 (26.3)	27 (27.3)	34 (34.3)	2 (2.0)
EBM decision-making process for patients by relying on the individual experiences of each physician denies the duration of his or her medical practice.	5 (5.1)	32 (32.3)	35 (35.4)	27 (27.3)	0 (0)
We do not have enough time to apply EBM in practice.	16 (16.2)	45 (45.5)	19 (19.2)	19 (19.2)	0 (0)
The newness of the EBM category and the need to learn a lot of new skills in this field.	20 (20.2)	55 (55.6)	8 (8.1)	16 (16.2)	0 (0)
We do not have enough skills to use it. The courses offered are as familiar as possible.	13 (13.1)	56 (56.1)	11 (11.1)	17 (17.2)	0 (0)
The heavy work of parts and the large number of crackers prevent the use of EBM.	40 (40.4)	35 (35.4)	11 (11.1)	12 (12.1)	0 (0)
It is not common among colleagues and in clinical departments, just as taking a look at it to be.	16 (16.2)	57 (57.6)	21 (21.2)	4 (4.0)	0 (0)
Professors and physicians’ expectations are based on reference books rather than being of evidence-based.	12 (12.1)	56 (56.6)	15 (15.2)	16 (16.2)	0 (0)
The lack of ability and expertise in search, review, and evaluation of evidence.	17 (17.2)	50 (50.5)	17 (17.2)	13 (13.1)	0 (0)
The lack of fluency in foreign languages, especially English language.	9 (9.1)	47 (47.5)	20 (20.2)	23 (23.2)	0 (0)
The lack of trained people for how to apply evidence findings to evidence-based care.	20 (20.2)	61 (61.6)	12 (12.1)	3 (3.0)	0 (0)

Table 2. Barriers of Implementation of Evidence-based Medicine in Clinical Environments in Communication With Patients

Barriers	I Quite Agree	I Agree	No Comments	I Disagree	I Quite Disagree
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
The difficulty of using evidence-based medicine (EBM) in practice and as much as estimating patient expectations.	11 (11.1)	49 (49.5)	27 (27.3)	11 (11.1)	0 (0)
There are many problems in using EBM to treat patients who do not choose the best option in choosing a treatment.	14 (14.1)	66 (66.7)	18 (18.2)	0 (0)	0 (0)
A lot of time to justify the patient to apply EBM.	10 (10.1)	66 (66.7)	15 (15.2)	7 (7.1)	0 (0)
The false medical information that some people get through the media.	28 (28.3)	54 (54.5)	12 (12.1)	4 (4.0)	0 (0)
Due to the large number of patients in government hospitals, there is not enough time to address EBM.	30 (30.3)	45 (45.5)	11 (11.1)	8 (8.1)	4 (4.0)

workshops and courses in this regard at the hospital level” and the “lack of mechanisms for monitoring and follow-up of EBM in education and treatment”. Moreover, 50% of the subjects stated that “failure to maintain additional and applied courses in this regard at the non-hospital level”, “the lack of mechanisms for monitoring and follow-up of EBM in education and treatment”, “failure to equip hospital departments and libraries with computers and

access the Internet and medical information sources on the EBM”, “the insufficient number of personnel for the use of EBM”, and “precise and strategic policymaking for EBM” have not been identified as the main barriers to the use of EBM concerning health system managers.

Based on the results of Table 5, the highest frequency was related to the “lack of adequate information from librarians and information scientists” (59.6), “the lack of

Table 3. Barriers to Implementation of Evidence-based Medicine in Clinical Environments in Relation to Evidence

Barriers	I Quite Agree	I Agree	No Comments	I Disagree	I Quite Disagree
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
High volume of medical information	20 (20.2)	52 (52.5)	14 (14.1)	11 (11.1)	0 (0)
Failure to access some of the available evidences	21 (21.2)	58 (58.6)	9 (9.1)	8 (8.1)	0 (0)
The lack of credible evidence in many areas of medical science	15 (15.2)	38 (38.4)	28 (28.3)	15 (15.2)	0 (0)
The novelty of this subject and the lack of knowledge of many physicians from it	15 (15.2)	60 (60.6)	16 (16.2)	2 (2.0)	0 (0)
The lack of sufficient evidence in some disciplines and specializations	14 (14.1)	44 (44.4)	27 (27.3)	7 (7.1)	2 (2.0)
The lack of access to the full text of some articles	20 (20.2)	47 (47.5)	16 (16.2)	12 (12.1)	0 (0)
The lack of a database containing clinical research, pharmaceutical and diagnostic domestically (in Persian)	24 (24.2)	49 (49.5)	17 (17.2)	5 (5.1)	1 (1.0)

Table 4. Barriers of Implementation of Evidence-based Medicine in Clinical Environments in Relation to Health System Managers

Barriers	I Quite Agree	I Agree	No Comments	I Disagree	I Quite Disagree
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Personal and organizational indifference to health	30 (30.3)	48 (48.5)	13 (13.1)	5 (5.1)	0 (0)
The lack of investment required to accomplish this	33 (33.3)	51 (51.5)	10 (10.1)	2 (2.0)	0 (0)
The lack of material and spiritual encouragement for physicians who use evidence-based medicine in medicine	35 (35.4)	42 (42.4)	19 (19.2)	0 (0)	0 (0)
Equipment failure departments and hospital libraries and sources of information into a computer and Internet access to EBM	17 (17.2)	59 (59.6)	14 (14.1)	6 (6.1)	0 (0)
The lack of complementary and practical courses and workshops in this regard in the hospital	23 (23.2)	61 (61.6)	10 (10.1)	2 (2.0)	0 (0)
The lack of monitoring and follow-up mechanisms for EBM in education and treatment	19 (19.2)	61 (61.6)	14 (14.1)	1 (1.0)	0 (0)
There is no precise and strategic policy for EBM	19 (19.2)	56 (56.6)	20 (20.2)	0 (0)	0 (0)
The lack of awareness of health managers about the need for EBM care	31 (31.3)	45 (45.5)	20 (20.2)	0 (0)	0 (0)
Insufficient number of personnel for EBM	20 (20.2)	57 (57.6)	11 (11.1)	8 (8.1)	0 (0)
The lack of financial support for attending conferences and workshops	31 (31.3)	43 (43.4)	21 (21.2)	1 (1.0)	0 (0)
The lack of written letters or regulations regarding the use of research findings in the clinic	26 (26.3)	41 (41.4)	27 (27.3)	2 (2.0)	0 (0)

Table 5. Barriers of Implementation of Evidence-based Medicine in Clinical Environments in Relation to Medical Librarians and Information Scientists

Barriers	I Quite Agree	I Agree	No Comments	I Disagree	I Quite Disagree
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
The lack of proper notification by medical librarians and information scientists	12 (12.1)	59 (59.6)	18 (18.2)	9 (9.1)	0 (0)
The lack of medical librarians and information scientists in the hospital	9 (9.1)	47 (47.5)	25 (25.3)	16 (16.2)	0 (0)
Not up-to-date information on medical librarians and information scientists in the hospital	11 (11.1)	48 (48.5)	16 (16.2)	21 (21.2)	0 (0)
The lack of collaboration with medical librarians and information scientists in finding articles related to medical evidence	11 (11.1)	46 (46.5)	24 (24.2)	15 (15.2)	2 (2.0)
The lack of training resources and databases using evidence-based medicine to physicians by medical librarians and information scientists	7 (7.1)	58 (58.6)	22 (22.2)	9 (9.1)	2 (2.0)
Limitation of the hours of libraries and librarians (not 24 hours)	21 (21.2)	51 (51.5)	15 (15.2)	11 (11.1)	0 (0)
The lack of follow-up of all clients' questions by medical librarians and information scientists in hospitals due to a lack of power	13 (13.1)	47 (47.5)	25 (25.3)	13 (13.1)	0 (0)

training for the use of evidence-based medical resources and databases by medical librarians and information scientists” (58.6%), and “the limitation of the working hours of libraries and librarians in hospitals (not 24 hours)” (51.5%), and more than 50% of the subjects referred to the three mentioned criteria as the most important barriers to the use of medical-based evidence.

Likewise, the scale of barriers to the use of EBM (0-100) had the highest and lowest means concerning health system managers (76.30) and medical library and information science (64.27), respectively. The study found that participants who took part in evidence-based medical courses and workshops had a lower mean score (10.96 ± 60.25) and standard deviation of barriers related to physicians compared to those who did not participate in the workshops (12.67 ± 67.00). The difference was statistically significant ($P < 0.05$), indicating that participation in the workshops had a positive impact on reducing the barriers related to this area. Additionally, the mean and standard deviation of the score of barriers related to patients in the group of participants in EBM courses and workshops (11.23 ± 63.60) and in the group that did not participate in the workshops (13.34 ± 75.83) were obtained. Thus, workshops did not report the barriers related to this area, which was significant ($P = 0.001$ and < 0.05). The difference in the average score of barriers in other areas was not significant.

Discussion

Approximately half of the residents (45.5%) mentioned that they had a moderate familiarity with the EBM category, and a few (4%) reported very little familiarity. Likewise, Abdelrahman and Thabet reported the attitude of all nurses regarding EBM in their study (5), which is consistent with the results of the present study. In addition, the results of the study by Sahebalzamani et al demonstrated that the community of residents does not have enough knowledge about EBM and its implications and uses (21). The results contradict those of the current research. This contradiction in outcomes may be due to differences in the attitude and awareness of individuals toward the use of EBM and the novelty of this category.

More than half of the residents participating in the study (67.7%) had not participated in the EBM workshops. The results of the study by Sadeghi et al are in line with this trend. According to the study, of the 94 resident participants in the study, only 7.4% of them had participated in a medical workshop (24). According to Gazrani et al, 77.8% of medical students (22) had not passed an EBM course or workshop, confirming the results of this research. Based on the findings of this study and other similar studies by universities regarding the organization of EBM workshops and courses, they have not had a desirable performance, which could be one of the most important barriers to the use of EBM. The results of the study by Mirzaei and Zahmatkesh represented that the implementation of short-term educational intervention programs for EBM

can have a positive impact on the students' knowledge and attitudes about the need for EBM applications (25).

According to the findings of this study, only 14.1% of the residents participated in the workshops related to this category, all of which called for the establishment of courses and workshops related to this category. Nouhi and Shakouri also indicated that holding courses related to the methods of analysis and application of evidence, as well as the development of evidence-based education on clinical studies, enhances the applied knowledge of aides in the field and creates opportunities for further study, and further study is of facilitators of EBM (26). Based on the findings, roughly half of the auxiliaries participating in the study (45.5%) reported the impact of EBM on improving patients and accelerating the treatment process at moderate levels, which conforms to the results of the study by Rangraz Jeddy et al. Based on their findings, 85% of physicians agreed to improve patient care using EBM, and 70% of them agreed that EBM was helpful in decision-making (27). Sadeghi et al also suggested that 80.6% of residents believe that the use of EBM improves the outcome of patients (24). In another study, 80% of physicians believed that the use of EBM was effective in improving the quality of care and providing patient services (22). Therefore, according to the results of these studies, from the viewpoint of physicians, “EBM” is based on health and acceleration of the treatment of patients with a positive effect.

According to the results of the study, the lack of trained people for the use of evidence-based research findings (61.6%) is the most important barrier for physicians, and at the next level, such as this method is not common among other colleagues and clinical settings; it is only viewed as a passing period (57.6%); the expectations of professors and physicians are based on reference books, not based on (56.6%), qualification The courses offered in this regard (56.1%), the novelty of the evidence-based medical category (55.6%), the different attitudes of other colleagues to EBM (52.5%), lack of ability and skill in seeking, criticizing and evaluating evidence and documentation (50.5%) are among the most important barriers to the use of EBM concerning physicians. According to Rangraz Jeddy et al, the different attitudes of other colleagues toward EBM and the need to learn new skills are among the barriers faced by physicians regarding the use of EBM (27), which is consistent with the findings of the present study. Other studies (6,22,28-30) also pointed out that the inability and lack of skill to search, critique, and evaluate evidence are among the most important barriers to the use of EBM. According to the findings of this study and those of similar studies, the lack of adequate skills in the use of EBM is one of the most important barriers faced by physicians, which is also due to the lack of training in this field, and the university should persuade educational groups and schools to take this matter seriously in the curriculum of medical students, residents, and other health professionals.

Regarding the results of the field related to the patients, the participants in the study found that there are many problems with the use of EBM for the treatment of patients who do not choose the best choice in treatment (66.7%), the time to justify the patient to implement the EBM (66.7%), and inaccurate medical information that some people receive through the media (54.5%) as the most important barriers to the use of EBM concerning patients, which is consistent with the results of the study of Rangraz Jeddy et al (27). Momenzadeh et al reported that the use of EBM in treating patients who do not choose the best treatment option leads to plenty of problems, as well as for the implementation of EBM, to justify the patient, which is one of the barriers associated with patients' use of EBM (28), their study results are in line with the findings of this study. Therefore, the degree of patient collaboration with a physician can be one of the facilitators of this category in treating patients. In addition, given that the timeliness of the justification of patients is presented as the most important barrier to patients, the crowds of clinics and government hospitals themselves can be inhibitors of evidence-based medical applications by health professionals.

Based on the evidence-based barriers, over 60% of healthcare providers struggle with novel subject matter and lack of knowledge, while 58.6% experience difficulty accessing available evidence. Additionally, 52.5% find it challenging to manage the high volume of medical information. These obstacles are the most significant barriers to implementing EBM. The findings of other studies also highlighted the high level of medical information and the lack of access to some evidence from the barriers mentioned to the use of the category (22,27,28). Universities and hospitals need to facilitate access to valid evidence for health professionals and provide necessary training in the search and evaluation skills of retrieved resources to physicians to overcome the volume of medical information according to the information gathered from this area.

Based on the results of the field of barriers related to health system managers, the lack of workshops and courses in this regard at the hospital level (61.6%) and the lack of mechanisms for monitoring and follow-up of EBM in education and training (61.6%) are among the most important barriers related to health system managers. In addition, the lack of equipping sections, libraries, and hospital information centers with computers and access to the internet and evidence-based medical information sources (59.6%), the insufficient number of personnel who use EBM (57.6%), and the lack of accurate and strategic policy-making for EBM (56.6%) are other important barriers to the use of EBM concerning health system managers. Karimian et al also concluded that, considering the lack of mechanisms for monitoring and following up on EBM in the education and treatment of one of the factors, it is important not to use EBM (6), which is in line with the results of this study.

The results of other studies demonstrated that lack of facilities and lack of support for the management system were the main barriers to the use of evidence-based care in hospitals (29-32), which is also consistent with the results of the present study. Takia et al considered limited access to modern technologies and computer systems as barriers to the use of EBM as well (33). Other studies have suggested that managers' lack of awareness of the necessity of evidence-based care is one of the main reasons behind the management-based barriers to evidence-based medical practices and a motivation factor in its use (29,34). The results of the study by West et al also revealed that physicians have a favorable attitude toward EBM in improving patient care and clinical decision-making and reducing treatment costs, but a lack of material and spiritual encouragement and a lack of investment in the need for physicians based on evidence by custodians in this area led physicians to be disregarded in using the best evidence in medicine (17). According to the results of this study and other similar studies, the lack of awareness of the managers and their lack of knowledge about the importance of the use of this category led to the creation of such barriers because if health system managers were justified in terms of the importance of this issue, they would provide necessary facilities at the level of hospitals, medical centers, and academics and adopt precise policies on this issue. Therefore, it seems that to eliminate the barriers associated with health system managers, it is necessary to increase their awareness of the importance of this issue.

Based on the results of the barriers related to medical librarians and information scientists, lack of appropriate information of librarians and information scientists (59.6%), lack of training on the use of evidence-based medical resources and databases by physicians for librarians and information scientists (58.6%), and the limitation of the hours of work of librarians and information scientists (not 24 hours) (51.5%) are the most important barriers to the use of EBM concerning librarians and information scientists. According to Movahedi et al, 45.5% of physicians considered the need to employ clinical librarianship services in hospitals and expect the skills of using and searching for evidence-based medical information sources to be taught to them by medical librarians (8). The results of this research are also consistent with the above-mentioned study, representing that the lack of training in the use of resources and bases evidence-based medical information for physicians by librarians and information scientists is one of the most important barriers associated with librarians. In the study of Momenzadeh et al, 39% of the participants explicitly stated that the librarian contributes to the acquisition of information to a large extent, and 45% of the physicians report librarian information (28), which contradicts the results of the present study.

It seems that the lack of appropriate information and training on the use of evidence-based medical resources

and databases by medical librarians and information scientists appears to be due to other barriers. For example, when managers understand the concept and importance of medical-based medicine, there is no evidence that they will be required to employ a specialized clinical librarian and provide library equipment, educational materials, 24-hour libraries, and hospital information centers. Further, the level of mastery and skill of the librarian in this category can influence the amount of information and education on the use of evidence-based medical resources. Lacking sufficient skill and control over the librarian reduces her/his self-esteem when providing such services. Therefore, it is necessary for medical librarians and information scientists themselves, as guides and specialists in this field, to obtain sufficient scientific and practical skills. For example, Soleimanzadeh-Najafi et al examined the extent of the familiarity of medical students and librarians with the duties of clinical librarians. According to his study, librarians and residents have relatively good theoretical knowledge of the clinical skills of a clinical librarian, but they need to be practical and learn the skills necessary to collaborate in a clinical setting so that they can play a more effective role in this category (35).

According to the findings, equalizing the scale of the barriers to the use of medical-based medicine (0-100) represented the highest and lowest means concerning health system managers (76.30%) and medical librarians and information scientists (64.27%), respectively. In the study of Parvinia Nasab et al, nurses and clinical staff identified the directorial and administrative barriers as the most important challenge in implementing evidence-based care (30), which is in line with the results of this study. Therefore, removing barriers related to health system managers can be one of the most important steps in the implementation and application of successful EBM. Moreover, according to the findings, people who did not attend EBM workshops and courses were more likely to report more barriers; thus, participating in workshops, training the necessary skills, and raising awareness in this category could dramatically reduce the barriers associated with physicians and patients.

One of the strengths of the present study is that the participating aides were not limited to specific disciplines or special centers, and data were collected between different disciplines and treatment centers, as well as from others. In addition, it can be noted that to determine the barriers to the use of EBM in the five mentioned areas, all similar studies were studied internally and abroad, barriers were extracted from documented studies, and barriers related to medical librarians and information scientists have been noted as well, as in most studies, only the importance of the existence of clinical librarians has been taken into consideration. Among the limitations of the study was the lack of cooperation of most of the fourth-year residents who were attending the study due to the high number of occupations and absence from the hospital. Further, some of the assistants did not have any

information on EBM, thus they were unable to answer the questions that were excluded from the questionnaire.

Conclusion

In general, there are many barriers to the use and implementation of EBM in the areas of study (physicians, patients, evidence, health system managers, medical librarians, and information scientists). However, comparing the results of this study with those of other studies (6,21,22,27,36), it seems that the barriers associated with physicians, health system managers, medical librarians, and information scientists were the lowest in comparison with those related to health system managers and physicians. Therefore, it seems to be the establishment of workshops to remove barriers associated with physicians. Health professionals should provide health system managers with information on the importance of regularly implementing modified medical-based EBM in hospitals to address barriers. The managers also employ sufficient staff, equip the libraries and information and research centers for access to the Internet and evidence-based databases, and establish mechanisms for monitoring, tracking, and encouraging staff to use EBM. Providing in-service training for librarians, providing appropriate tools for information and education, employing empowerment forces in this area, and increasing the hours of work offered by libraries and information centers in health centers are among the actions recommended to overcome the barriers associated with medical librarians and information scientists. The results of this study provide clear information about the barriers available to experts. This study has been one of the important steps in the non-application of EBM (i.e., identification of barriers). Therefore, authorities, policymakers, and relevant managers can plan based on their outcomes, and to address the barriers to EBM in health centers and hospitals, they have been working to provide better, more successful, and more cost-effective healthcare services.

Acknowledgments

The authors thank the clinical residents participating in this research and the Deputy of Research and Technology at Hamadan University of Medical Sciences.

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Competing Interests

The authors declare no conflict of interests.

Ethical Approval

The study has been approved by the Ethics Committee of Hamadan University of Medical Sciences (Ethical code: IR.UMSHA.REC.1396.224).

Funding

This study was funded by the Vice-Chancellor for Research and Technology, Hamadan University of Medical Sciences (No. 9603161746).

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