The Concept of Evidence Based Medicine in Various Resources, and its Integration into Medical Education in the Turkish Context: Review

Çeşitli Kaynaklarda Kanıta Dayalı Tıp ve Türkiye'de Tıp Eğitimine Entegrasyonu

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ABSTRACT Evidence Based Medicine (EBM) is a way of renewing reliable medical knowledge in clinic practice over the clinic experiences, and progressively used in several disciplines. Best clinic decision making process needs briefly updated, attentive, explicit and suitable medical database. We aimed to point out the concept of EBM in various resources and its integration into medical education in the Turkish context. We searched several national databases to realize the life span of EBM in articles and books. First dissertations, scientific events and implementations sorted by time. First one of the publications in this topic released in 2000 in our country, and the definition, importance and evolution of EBM was emphasized in this article. Each one of these publications, of which, the numbers have been increasing in the subsequent years, has been an important corner stone in development and becoming widespread of this newly nominated medical approach. Rational drug usage courses of Ministry of Health, some activities like adaptation educations in family medicine, and activities, publications and educations of Turkish Medical Association and some lectures supported and facilitated the usage and evolution of this new philosophy. While deficiency of education in this topic is established as the most important barrier to the improvement of EBM; others are scarcity of sources in Turkish language, inadequacy in foreign language, deficiency of interest and motivation, internet access problem and inadequacy of time. We concluded that medical faculties, Ministry of Health in term of continuous medical education and academicians have their own duties in this topic to canalize physicians to the true, effective and ethical usage of EBM approach in clinical decision making.

Key Words: Evidence based medicine, decision making, education, ethics

ÖZET Kanıta Dayalı Tıp (KDT), klinik pratiğinde klinik tecrübelerin üzerine güvenilir tıbbi bilgi yenilemenin bir yoludur ve artan bir şekilde çeşitli disiplinlerde kullanılmaktadır. En iyi klinik karar verme süreci özetle; güncellenmiş, dikkatle seçilmiş, açıkça ortaya konulmuş ve uygun medikal veri tabanı gerektirir. Biz, çeşitli kaynaklarda KDT kavramını, tıbbi eğitime entegrasyonunuTürkiye bağlamında ortaya koymayı amaçladık. Çeşitli makale ve kitaplarda KDT'nin gelişme sürecini kavramak için ulusal veri tabanlarını taradık. Öncelikle tezler, bilimsel aktiviteler ve uygulamalar tarih sırasına göre dizildi. Ülkemizde bu konudaki yayınların ilki 2000 yılında yayımlanmış olup, bu makalede KDT'nin tanımı, önemi ve gelişimi vurgulanmıştır. Sonraki yıllarda sayıları artan bu alandaki yayınların her biri bu yeni tıbbi yaklaşımın gelişmesi ve yayılmasında önemli temel oluşturmuştur. Sağlık Bakanlığı'nın akılcı ilaç kullanımı kursları, aile hekimliği uyum eğitimleri benzeri aktiviteleri ve Türk Tabipleri Birliği'nin aktiviteleri, yayınları, eğitimleri ve bazı dersler bu yeni felsefenin kullanımını ve gelişimini desteklemiş ve kolaylaştırmıştır. KDT'nin gelişiminin önündeki en önemli engel olarak bu konudaki eğitim eksikliği saptanırken, diğer nedenler; Türkçe kaynak azlığı, yabancı dil düzeyindeki yetersizlik, ilgi ve motivasyon eksikliği, internete ulaşım sorunu ve zaman yetersizliğidir. Bu konuda, tıp fakültelerinin, sürekli tıp eğitimi açısından Sağlık Bakanlığının ve akademisyenlerin klinik karar vermede KDT uygulamasının doğru, etkili ve etik olarak kullanımı konusunda, hekimleri kanalize etme yükümlüğünde olduklarının sonucuna varıldı.

Anahtar Kelimeler: Kanıta dayalı tıp, karar verme, eğitim, etik

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While it has been told in some sources that EBM concept emerged for the first time in Paris, according to some other sources, it occurred as a result of an interest towards medical studies in order that Dr. Cochrane (1909-1988) could not get satisfactory results from the psychoanalytic treatment methods for the treatment of sexual function disorders.[1,2] It appeared for he first time as a clinical learning method developed in over 10 years at Mc Master Medical School in Canada in 1980s.[3,4] Teaching staff of Clinical Epidemiology and Biostatistics Departments performed a serial of studies about critical article reading.[2] Although the phrase "evidence-based" was first used by David Eddy in 1990, "evidence-based medicine" as a term was also employed in a paper by Guyatt et al in 1992.[2,5]

Throughout human history, human beings have been in a medical search through various ways to soothe their pain, to avoid diseases, to recover from disabilities and to extend their lifetime. The medical knowledge that we use today is outcome of the past. Although evidence-based medicine appeared as a clinical learning method in 1980s, its origin dates back to ancient times.

Evidence-based medicine is the attentive, explicit and rational use of best currently available evidence in any decision related with patient care. It is the integration of best currently available evidence gained through clinical experience and systematic investigation with values and expectations of a patient. Best currently available evidences are integrated with patients' conditions and preferences in order to improve the quality of clinicians' decisions.

The most cited definition of EBM is the one by Sackett et al, as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. Sackett et al mention six arguments for EBM practices, which seem to replace traditional authority-based clinical practices.[4,,6]

- There have been new types of evidence that enhance our capacity to help patients.
- Although it is certain that we need these evidences everyda, we usually do not have them.
- As time passes, there has been a decline in both our up-to-date knowledge and clinical service performance.
- The attempts to overcome these deficiencies through traditional continuous education programs do not help to enhance performance.
- New approaches prove to be useful in learning since they provide up-to-date knowledge.
- It should not be ignored that EBM poses an acceptable or even required limitation to clinical freedom.[7]

EBM is use of established knowledge in a careful, clear and logical way. Clinical experience is valuable only if it is used in accordance with clinical evidence. Definitions point out that, besides the importance of reaching the best evidence, it is also important that the evidence should be convenient to be applied on individuals.[8]

With its most comprehensive definition, EBM is a model of change, which is closely concerned with all health-related processes ranging from knowledge production to daily use of knowledge; from health-related planning to health-related purchases; from medical education to the planning of education; which aims to make radical changes on these processes; and which is to affect these processes more strongly in the 21st century. At the same time, EBM is an intellectual field. The target of "producing and disseminating knowledge for evidence-based policy and practices" is included among health targets that the World Health Organization defined under 21 titles for the 21st century.[9]

For a safer, more careful and more effective management of the patient, sources about diagnosis and treatment for the management of clinical problems should be true, up to date and current.

EBM practice embraces asking answerable questions, searching for the best evidence, analyzing the evidence, evaluating the results of the analysis, checking out the clinical decisions, surely not giving harm to the patient and self-evaluation of the physician about daily practices.

EBM education includes two educational processes. First of them involves presentation of EBM

as a concept, and the second one involves how to use EMB in practice.[8]

It must be emphasized within EBM that medicine is not a science only, but also a discipline that is being practiced, it needs true syntheses of scientific rules related with various fields in relation with various practices, paramedical fields, patient preferences, and this necessity can only be provided by a critical point of view.

EVIDENCE-BASED MEDICINE IN TURKEY

II.1. PAPERS ON EVIDENCE-BASED MEDICINE

The journals included in Turk Medline were surveyed to provide an overview of EBM development in Turkey. The survey shows that EBM was first treated in Turkey by Demirkan et al in a paper published at Ankara University Journal of Faculty of Medicine in 2000. This paper emphasizes the definition, importance and development of EBM.[10]

The second paper on EBM, published in 2001, deals with the use of EBM in preventive health services as a new approach.[11]

In 2002, two papers on EBM were published in Turk Medline. One of these papers is about medical education, a field where it is very important to integrate EBM. This paper, published in the Journal of Forensic Sciences, investigates the place of forensic medicine in pre-graduation medical education in terms of knowledge, skills and attitude objectives.[12]

Another publication of 2002 provides an overview of basic concepts about EBM and discusses positive and negative viewpoints on EBM as well as opportunities for the use of evidence-based data particularly in psychiatry.[13]

In the following year (2003), one paper was published about EBM in the journals included in Turk Medline. This paper, published in Turkish Clinics Journal of Medical Ethics, Law and History, makes an ethical evaluation on the use of off-label drugs.[14]

In 2004 and 2005, four papers were published about EBM in the journals included in Turk Medline. These papers continue to define and give an overview of EBM.[15,16] In one of the papers, EBM is discussed in terms of primary health care services and drug selection.[17] Another paper investigates a clinical case in the light of EBM guidelines.[18]

The first publications about EBM in Turkish Medical Database are four papers published in 2005. These papers are about EBM and its use in perinatology nursing, forensic palynology, EBM and laboratory tests, and intra-articular corticosteroid and hyaluronic acid injections in osteoarthritis management.[19-22]

The first paper on EBM to appear in a journal included in international citation index was published in 2006. This paper discusses the effect of paclitaxel-eluting stents on restenosis within the frame of evidence-based medicine.[23]

In a paper of 2006, evidence-based child health practices were discussed in view of child health in Turkey and in the world.[24]

EBM was investigated in terms of its definition, library studies, medical disciplines, nursing and use of antibiotics between the years 2004 and 2007 in national publications other than the journals included by Turk Medline and Turkish Medical Database.[25-30]

II.2. BOOKS ON EVIDENCE-BASED MEDICINE

The first book on EBM in our country is "What is Evidence-Based Medicine" written by Gül Ergör and published in 2003. In this book, EBM is treated in its various aspects under the following titles:[31]

- Construction of Answerable Clinical Questions
- Finding the Best Evidence
- Critical Appraisal in Diagnosis Articles
- Critical Appraisal in Prognosis Articles
- Critical Appraisal in Works about Treatment
- Critical Appraisal in Articles about Harm
- What is Systemic Evaluation? How is Systemic Evaluation Carried Out?
- Primary Health Care and EBM
- EBM and Applications in Cardiology
- Evidence-Based Surgery
- EBM from Ethical Perspective

Furthermore, in 2007, Ahmet Topuzoğlu and Pınar Ay Topuzoğlu published a book titled "Evidence-Based Medicine: Critical Evaluation of Clinical Epidemiology Research".[32]

II.3. DISSERTATIONS ON EVIDENCE-BASED MEDICINE

A medical thesis on EBM was written in one of the youngest medical discipline of our country, i.e. family medicine. The dissertation titled "Evidence-based medicine approaches of primary health care physicians", written by Rabia Kahveci, MD at Ministry of Health Ankara Education and Research Hospital, discusses the approaches of physicians to EBM, EBM practices, the factors that affect applications and the effect of specialization training on EBM practices.[33]

II.4. EVIDENCE-BASED MEDICINE, SCIENTIFIC EVENTS AND IMPLEMENTATIONS AT FACULTIES OF MEDICINE

EBM has begun to have directs impacts on medical education as of late 1980s. With the use of EBM method during clinical decision-making processes, students are enabled to

- learn to read the medical literature through a more critical method, and
- acquire new skills in the self-learning process.[34]

In our country, faculties of medicine are in a continuous search and endeavor to develop medical education. The first symposium on this topic, "Medical Education Symposium", was held by the Program in Child Health and Diseases, Faculty of Medicine, İstanbul University in 17-19 October 1996 in İstanbul.

Congresses and other scientific events have been held to discuss and develop evidence-based medicine. Associations for each specialization field require a central planning in addition to their internal structuring efforts and works.

The recent congresses in our country have specific sessions dedicated to EBM, and some scientific events provide training on EBM. For the first time in our country, an International EBM Symposium was held in 23-25 March 2008 in Antalya.

In recent years, our country witnessed the establishment of departments of medical education and units for the development of medical education (Unit of Medical Education and Information) as well as the organization of programs for the training of trainers.

EBM has been an opportunity in our country to change traditional education in some faculties which aim to train medical students through research results rather than opinions of experts. This opportunity was used and developed at different levels in the faculties of medicine. In recent years, EBM has been integrated into the curricula of faculties of medicine. Since the academic year 2002–2003, programs have been introduced in an increasing number of faculties of medicine at universities, including mainly at Ankara University, Dokuz Eylül University and Marmara University, so as to ensure the adoption, understanding and application of EBM approach.

By the way of EBM programs, the student should become able to differentiate ill/healthy, normal/abnormal, should know what statistical significance is, should know the types of data, and should be able to select the tests to evaluate the data, should have some knowledge about observational studies and case presentations, should have a view about favorable features of each study type to the others, and should have got the skill to read and evaluate an article. The students should know how to reach current data whenever they face clinical problems, and should have knowledge about concepts as health economy and patient safety.

Following the initial introduction (2000-2002) of EBM through scientific papers in Turkey, the topic has also been taken into consideration by specialized associations of various disciplines. The meaning and content of EBM has been enhancing, and new concepts and terms have been produced based on this concept, such as EBM and psychiatry, EBM and health service, EBM surgery, and EBM and oncology.[27]

One of the factors to contribute to the development of EBM in our country is the recent increase in Turkish publications in international citation

indexes and the establishment of national database. In this respect, ULAKBiM began to establish databases in scientific disciplines with decision no. 44 of 7 October 2005 of the governing body so that scientific journals in Turkey can be published regularly in a certain format, and integrated into indexes. Accordingly, ULAKBİM established four Turkish databases. One of these databases is the "Turkish Medical Database" .

For the same purpose, "Database Workshop" was held in our country for the first time on 2 November 2007. The main emphasis of this workshop was that the interest in scientific research published in Turkey was inadequate because it was commonly considered that the scientific value of Turkish papers was low.

Between the years 1981 and 2005, the number of scientific publications from Turkey increased by 25 times. Further, the international references to Turkish-based scientific publications increased by 46 times.

In 2006, the total number of publications included in SCI, SSCI and AHCI was 16836; and the number of publications per each faculty member was 0.52 per year (Only full articles are included in this number; other types of documents are not taken into consideration. These data are results of the survey on 2 February 2007).

Although there is not a journal which is directly dedicated to EBM in our country, journals have begun to reserve specific parts to EBM. In these parts, clinical cases are generally evaluated in view of the EBM approach.[23,35]

The Ministry of Health also has EBM-oriented efforts such as the publication of Rational Drug Use and Drug and Treatment Guides, and Trainings for Transition to Family Medicine.

EBM-RELATED ACTIVITIES OF THE MINISTRY OF HEALTH

The Ministry of Health *Hıfzısıhha* School held the "Workshop of Rational Drug Use" in Ankara on 22 and 23 December 2006. The following are EBM-related solution proposals mentioned in the conclusion report of this workshop:

- It is required to enhance physicians' awareness and responsibility about evidence-based and cost-effective prescribing.
- In our country, it is required to establish a structuring to develop and update standard diagnosis and treatment guides, and to inform physicians on the use of traditional and new treatment methods and use of drugs.
- Physicians should be informed regularly on new treatment methods, new principles and EBM practices emerging with developing technologies. To this end, a monthly bulletin should be published and/or a website should be established.
- Physicians should have access to diagnosis and treatment guides before they graduate.

LECTURE NOTES FOR FAMILY PHYSICIANS (FIRST BOOK) AND EVIDENCE-BASED MEDICINE

EBM is also emphasized in Lecture Notes for Family Physicians (First Book), devised by the Ministry of Health to be used as an educational material in trainings transition to family medicine. The book;

- indicates that Article 19, i.e. the stipulation to "produce and disseminate knowledge about evidence-based policy and practices", is included among health targets that WHO defined under 21 titles for the 21st century.[9,36]
- when identifying common mistakes at undifferentiated disease management under the title "approach to undifferentiated patients", underlines "the lack of use of evidence-based medicine and treatment guides", "the importance and development of diagnosis and treatment guides" and "the discussion of sample cases".[37]
- when defining the characteristics of periodical examination guides in part "Periodical Health Examinations", concentrates on "the development of examinations on the basis of evidence" and "the level of scientific evidence."[38]
- in part "How to Read an Article", treats the EBM approach and evaluation of evidenc.[39]

TURKISH MEDICAL ASSOCIATION AND EVIDENCE-BASED MEDICINE

Turkish Medical Association (TMA), in its activities and publications, makes emphasis on EBM. Under the part "Public Health Development" of the Conclusions of the 12th Congress on Specialization Training in Medicine held in İzmir on 1-3 December 2006 by the Coordination Council of TMA Specialization Associations, Article 27 reads as follows: "Specialization Associations should carry out research to identify problems of primary importance, give importance to health education, draw up a guide of early diagnosis, endeavor to promote rational drug use and technology use, and give priority to evidence-based practices" Further, TMA deals with EBM in its scientific journal on primary health care services; the article about "EBM and drug selection" is the 7th publication to be included in national indexes in our country.[17]

TMA also drew attention to EBM in Dr. Füsun Sayek Meeting of Medical Education, which it held in İstanbul on 30-31 March 2007.

ASSOCIATION OF EVIDENCE BASED MEDICINE AND ETHICS

Besides maintaining a healthy life, wishing to receive better service and wishing to be informed, healthy individual finds "medical interventions with an approach that considers cultural and social esteems" more familiar

The interaction between the service providers and consumers in the health system is a process that goes on not only in case of disease, but also during the healthy period. The patient usually wants the most effective, safest and the fastest treatment plan to be chosen. Besides this expectation, he also wishes to evaluate choices that are most appropriate for his cultural and perceptive status before the final decision.[40]

After reaching the best evidence, it is expected from the physician to include the patient into the decision process and it is expected from the patient to exhibit his preferences. EBM approach predicts to reach optimum quality of life when most current evidence is used together with the experience of health care givers and the involvement of the health service consumer.

One of the most important topics among the application steps of EBM is correspondence to "not giving harm to the patient", which is one of the basic concepts of medical ethics. First of all, treatment choice should not give harm to the patient. A good physician is the one who can use both his clinical experiences and the best current evidence. Neither the best clinical experience, nor the best evidence can be adequate alone.[41] As the best evidence would not be appropriate for the patient without the presence of clinical experience, also the clinical experience loses its currency in the absence of best evidence, and this would not be good for the patient in the presence of clinical risks.

In EBM applications, decrease of treatment risks that can harm the patients, getting the expected and understandable results from clinical decision making processes, more reasonable clinical processes would only be possible by planning researches and comparison of the results of these researches.[42]

Clinical choices under the coverage of EBM should be made according to proportionality principle. It would be useful to reevaluate the choices according to risk/benefit, or boredom to be tolerated/benefit to be received. It is inevitable that the professional liability of the physician will stand in the forefront at the application time of this choice. If risk/benefit ratio is not low enough, the benefit that will be brought by EBM approach should be reevaluated.

Before the application of the treatment approach that is chosen according to the best evidence gathered, the preferences of the patient, and according to the circumstances, the relatives of the patient, should be considered. Within this context, not giving harm to the patient is the major responsibility of the physician.

Follow up of the patient should be done just on time decided according to the treatment choice, and the record of the patient should be accurate.

Undesired effects of the treatment, their frequencies, the relation of undesired effects with the treatment modality, and evaluation of the results should all be performed on time and recorded. Elimination of undesired effects by the way of use of safer treatment modalities can only be possible by strict follow up of the patients.

Keeping in the mind that each patient benefits to a degree from a treatment modality different than the other patients, the aims of the treatment plan, the amount of benefit expected from medical care and treatment, the preferences of the patient about the treatment, if the patient gave informed consent or not, if the patient is intellectually or legally sufficient, his previously declared preferences related to the treatment, unwillingness of the patient about the treatment process all indicate the necessity of taking care about ethics at the decision time.[43]

OBSTACLES TO THE DEVELOPMENT OF EVIDENCE-BASED MEDICINE

EBM results in an acceptable and sometimes necessary restriction to clinical freedom.

We could not find in the literature any original article performed in Turkey about the obstacles to the development or practice of EBM.

Physicians believe that the most important obstacle to the development of EBM applications is lack of education.

Among the other primary obstacles are

- insufficiency of evidence in Turkish,
- lack of competence in English,
- lack of interest and motivation.
- limitations of accessibility and opportunities as well as time limitations.

EBM can exhibit reductive approach during the application and this results in loss of creativity in the production of new solutions[33].

Further, the excessive number of policlinics is one of the most important problems in practice.

THINGS TO DO TO DEVELOP EVIDENCE-BASED MEDICINE

The concept has recently been used in Turkey; and universities have been engaged in various activities to promote real-life use of EBM. However, in order to intensify and enhance these newborn efforts, a central planning is required beginning from medical education, in addition to internal structuring and efforts of each individual institution.

Evidence based medicine must be integrated to medical education. "Because of its nature, integrating fundamental EBM content is a challenge in preclinical years". But it has been shown by Keim et al that "integration of an educational EBM search tool can be positively received by preclinical medical students."[44] Taheri et al showed that EBM can be taught by workshops to undergraduate students, and it results in increased ability to form clinical questions and to carry out appropriate literature searches.[45]

An appropriate infrastructure is required for physicians and students to enhance electronic access to information.[34]

VIII. 1. AT FACULTIES OF MEDICINE

- Students of medicine should be furnished with basic epidemiological and statistical knowledge, and knowledge on article reading and evaluation for critical appraisal.
- Foreign language should be taught so that they can follow the literature.
- EBM should be more integrated into medical education.
- Internet education should be offered so that they can continue professional training and EBM practices.

VIII. 2. IN TERMS OF CONTINUOUS MEDICAL EDUCATION

- Specialization associations should be more active.
- Internet education should be offered so that they can continue professional training and EBM practices.

■ Training is needed for Internet-based EBM.

■ The use of continuously updated electronic textbooks should be encouraged in place of traditional textbooks.

■ EBM seminars for physicians should be given.

■ In addition to programmed methods which require more than one meeting such as seminars and trainings, one-time meetings with short instructions should be organized.

■ Evidence in Turkish should be promoted.

■ The foreign language skills of physicians should be improved.

■ Structured guides should be designed and their use should be promoted.

Clinical librarianship applications that predict to transport literatures of medicine and health sciences to bedside should be generalized as one of the safest solutions to problems of reaching to knowledge related with medicine and health.[46]

VIII.3. IN TERMS OF ACADEMICS

■ Academic promotion criteria should be redefined. The support for publications in international resources should be provided for the national ones as well, and financial support for researchers should be increased.

■ Clinical medicine journals have so far failed to meet information needs of physicians and to serve as a bridge between applications and clinical research. One of the most important reasons behind this failure is that the publications in clinical journals do not provide physicians with the motivation to alter their practices. The journals should give priority to evidence-based publications.

■ Advanced research is required to identify obstacles, demands and needs of physicians related with EBM applications. Physicians should be equipped with skills for EBM applications; training needs for EBM should be identified; and opportunities for access to information should be facilitated so that information can be applicable in daily practices.

VIII. 4. IN TERMS OF MANAGEMENT

■ Work schedules should be rearranged so that physicians can spare time for scientific and social activities; and physicians should be provided with time required to offer an effective service to patients.

Besides providing improvement of health services and enhancing transfer of current evidence to practice, EBM also provides opportunity to self education, to lifetime learning and to learn during daily practice. EBM is defragmentation of best evidence with the experience of clinical and community based implementers and the values of service consumers. The aim is to clarify the risks threatening health, to reach to better diagnostic tests, to get knowledge in order to realize more potent and at the same time safer treatment choices. This is a process that must repeat as a cycle. It has already been a desired principle that physicians should take place in a learning and experiencing circle for a lifetime.[47]

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