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# Evidence-Based Medicine and Internet Journal of Health

M Takrouri

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## Abstract

In this editorial reader can find an introductory comment on this issue of Internet Journal of Health. Many contributors to this number submitted their numerical data on health related issue either in society or in hospital and express it in number which are subjected to statistical analysis to see that the findings of their study are as near to the truth as can be.

There are general tendency since two decade to support evidence based medicine and evidence based healthcare. By doing that it only governs decision making more realistic and reproducible.

Evidence based medicine is not easy task. It needs five difficult steps to be implemented and there are other supporting mechanism to give verdicts when evidence from scientific studies contradicts i.e. Systemic reviews and Meta analysis. Still all that is time consuming so the medical circles together with the epidemiologists and health care personnel would refer to special EBM journals, Critically-Appraised Topics (CATs), Patient- Oriented Evidence that Matters (POEMs) and guidelines in order to save time and get the evidence critically processed.

This editorial is written to encourage such activities to enrich the public with truthful information

## EVIDENCE-BASED MEDICINE

In this issue of Internet Journal of Health, many articles presented to our valuable readers. They are well searched numerically evidenced with statistical methods to eliminate the role of chance in affecting the result. [1,2,3,4]

Nowadays, it is usual to find in professional journals, medical and health information which is described as being evidence-based. Its coined term is “Evidence-Based Medicine” (EBM). An important requirement of EBM is an explicit and systematic use of clinical evidence. EBM is: the conscientious, explicit, and judicious use of current best evidence, in making decisions about the care of individual patients” [5].

The philosophical roots of EBM can also be traced back, to 19th century Paris [5] Pierre Charles Alexandre Louis, for instance, was the founder of the “numerical method” in medicine, basing choice of treatment on careful observation and collection of data. Some other work of well known physicians such as Magendie, Bichat and Louis supported the search for evidence on any health issue. [5]

A more recent antecedent is clinical epidemiology. In contrast to classical epidemiology where observations in individuals are extrapolated to disease at the population level, clinical epidemiology reverses the direction of

reasoning, and information acquired from groups of subjects are used to make decisions concerning individual patients and groups of patients or people [6]. The methods of clinical epidemiology are the methods of EBM.

The current EBM practice can be traced to the early 1990s, when a group of doctors at the McMaster University in Canada, “the evidence-based medicine working group”, published an article in the Journal of the American Medical Association in 1992. In which they described a new approach to teaching the practice of medicine. They advocated a new paradigm in which clinical decisions should be made on systematic observation and with decreased emphasis on authority opinions [7]. There is a general agreement that EBM is the integration of best research evidence with clinical expertise and patient values” [8].

The essential components are:

1. The evidence,
2. Clinical experience and
3. The patient.

In short, EBM is a philosophy governing decision on appropriate treatment for a patient. This philosophy depends fundamentally on utilitarian and empirical principles. It

assumes that the physician knows what mode of treatments known to work, and then supplement his knowledge with his/her own expertise, taking into consideration the patient's circumstances. In this way, a course of action which is most likely to benefit the patient.

What factors detected those treatments shown to work? This is a matter of numbers – the treatment must have been tried on other patients of similar condition and the results were carefully observed.

EBM focuses on the individual patient. The term “evidence-based healthcare” is sometimes used to describe the application of evidence-based approaches at the population level. The decision about groups of patients or populations are based on a combination of three factors:

1. Evidence
2. Values
3. Resources

Opinion-based decision-making gives little attention to evidence derived from research. However, as the pressure on resources which are available for healthcare increases, decisions will be made explicitly and openly, this will lead to a transition from opinion-based decision-making to evidence-based decision making [9].

## **THE EVIDENCE**

What constitutes evidence? Evidence is information from research – the “truth” as demonstrated objectively through scientific studies. However, evidence also encompasses expert opinion and consensus. It is assumed that experts base their opinions on their wide knowledge of their field, as well as their own personal clinical experience. This means there are many kinds of evidence; and all these kinds of evidence may be used to support assertions of what the “truth” is.

There is a hierarchy or structured form of evidence, and higher levels of evidence are the greater likelihood of reflecting the “truth” than lower levels. Scientific studies are taken as the higher level of evidence than expert opinion because we can examine the results for ourselves, we can follow the process of reasoning the researches took, and examine all steps of the research methodology. This is usually is not accessible from the subjective opinion and consensus, especially if it is not based on scientific studies. Experimental studies provide evidence of a higher level than observational studies because properly conducted

experiments can control for biases and confounding factors more effectively than observational studies.

In summary as the hierarchy of evidence as concerned, evidence from randomized controlled trials is placed at the top. This is followed by controlled trials without randomization, and other prospective experimental trials. Observational studies follow and prospective cohort studies are the best of these, then case-control studies, and then case series. Expert opinion and consensus ranked at the rear. At all levels, a systematic review of the existing studies, with meta-analysis where applicable, is to be preferred. Such a hierarchy only tells us the likelihood that the evidence reflects the “truth”. The hierarchy only exists as convenient shorthand for evaluating the strength of evidence – it does not eliminate the need to critically appraise individual studies. Although expert opinion in the absence of higher evidence may sit lowly in this hierarchy, this is not a repudiation of the utility of expert opinion. Consensus is often an essential part of having clinical practices implemented. [10]

## **SCIENTIFIC STUDIES**

There are various factors which influence the “truth” presented from a scientific study.

The number of the subjects in a study is one important factor– the larger the study size, the less likely that any results observed are the result of statistical fluctuation.

The control group of the study is another important factor – the control should be the same, as far as possible, as a study subject, except for the item of interest under study (e.g. a risk factor or an intervention).

Randomization of study subjects is the most powerful factor helping in finding the truth. Randomization into either a control arm or an interventional arm of a clinical trial. Whereas selecting study subjects to be as similar as possible can control for known confounding factors, randomization has the added property of controlling for confounding factors that are unknown to the investigators. Confounding factors may be initiated by motivated patients or co-researchers which act as tipping the balance toward wrong non truthful results. In a large enough number of study population and an adequate randomization procedure, even in the presence of confounding factors, such confounding factors should be evenly distributed between the control and the interventional arms.

## **SYSTEMIC REVIEWS AND META ANALYSIS**

The question of EBM may be confusing when two or more similar studies that came up with different results.

Which one is closer to the “truth”?

Is it sufficient to just find one study that supports the conclusion you had hoped for in the first place?

This is where the systematic review and meta-analysis can help.

This is usually done when one critically appraising all relevant studies and statistically combining the results. This can be a useful method in order to make sense of information taken from different studies. However, it is necessary for the researcher to exercise caution in interpreting the results – Meta analysis is only as good as the studies it combines.

## **THE PRACTICE OF EBM**

The practice of EBM involves a five-step approach [8,9,10,11]

Steps in the practice of EBM

1. Define the problem
2. Find the information you need
3. Critically appraise the information
4. Apply the evidence to the patient
5. Evaluate how much this evidence is useful to the practice

The practice of evidence-based medicine is not an easy thing. It demands an investment in time and resources that some may feel is untenable, given the busy work lives one leads today. Suppose the same clinical question is asked by several doctors. It is unpractical to have each doctor on his own to work through the five-step approach. This is the reason why various evidence-based methods and resources have been developed to help the busy practitioner.

The clinical studies are considered the primary sources of information; secondary resources do gather primary information in a systematic and reliable fashion.

These are in the form of critically-appraised topics (CATs). These are one-page summaries of the available evidence on common clinical questions, prepared by clinicians such as

you. The CAT is then made available for other doctors to use.

Also health professional journals include short summaries called Patient- Oriented Evidence that Matters (POEMs) in each edition [6, 12,13].

There are secondary journals such as Evidence-Based Medicine and the ACP Journal Club contain only summaries of critically- appraised primary studies published elsewhere. Another invaluable aid is evidence-based guidelines. The groups of experts who develop the guidelines do the work of searching for the evidence, appraising and synthesizing it, applying it to local circumstances, and making recommendations for clinical practice based on the evidence.

Word of cautions should be mentioned here. The methodology of EBM is still developing. Methods for evaluating treatments are different from evaluating diagnostic tests, which are again different from evaluating risk factors. While the steps in critical appraisal of randomized controlled trials are advanced and well-recognized, the same is not true for other study designs [10,11,12,13].

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**Author Information**

**Mohamad Said Maani Takroui, MB CH B FRCA (I)**  
Professor, King Saud University Medical College