

**Evidence based decision-making**

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**Abstract**

Medical practitioners pioneered evidence-based decision-making in the early 1990s. Discipline comes from making decisions concerning individual patients care based on the most recent and best evidence available. Data-based medicine necessitates methodical study and the integration of individual clinical skills with the best available external clinical evidence based on the patient's unique values and circumstances. Depending on the data collection method, the evidence supplied a variety of strengths in this scenario. Evidence-based

decision-making was then extended to the allied health industry. Three key data gathering tools now dominate public health and especially the crisis-affected population. It includes a) Assessment of Rapid Health b) Population based survey and c) Surveillance of Disease. Furthermore, the strength of the evidence supplied through these methods cannot be easily assessed using evidence-based medicine's grading criteria. Because of the various advantages of evidence in public health, such as strategic decision making, programme implementation, monitoring, and evaluation, this is not

straightforward. Varied applications have different time frames for determining the strength and proof of the evidence. Consequently, it is difficult to combine data from several sources acquired in various ways, public health professionals have defined the best available evidence by combining all available sources to provide meaningful information for decision-making.

**Keywords:** Evidence, Decision-making, Research, Technology, Advancements, Interpretation

### **Introduction**

Epistemology is the philosophical study of the nature, origins, and constraints of human knowledge. The derivation of the term is from the Greek word “epistemo” and “logos”. It is sometimes referred to as the doctrine of wisdom. In epistemology, evidence justifies beliefs or rationalizes them to have a particular orthodox attitude. For example, the perceptual experience of a tree can serve as evidence to support the belief that a tree exists. The evidence is generally understood as a private mental state in this role. Other fields, including science and the legal system, emphasize the public nature of evidence. In the philosophy of science, it means evidence that confirms or refutes scientific hypotheses.<sup>[1]</sup> For example, Mercury's "irregular" orbit dimensions can be considered evidence to support Einstein's general theory of relativity. To play the role of a neutral mediator between competing theories, scientific evidence must be public and controversial, such as observable physical objects or phenomena, which proponents of different theories can accept as evidence. Following the scientific method confirms this, leading to scientific consensus based on the systematic collecting of evidence.<sup>[2]</sup>

### **A Preamble to EBDM**

EBM is the process of making decisions about a program, practice, or approach based on the best

available research evidence and empirical evidence from the field and relevant evidence. The framework will collaborate with researchers and clinicians to provide a more comprehensive view of the relevant and necessary decision-making evidence.<sup>[3]</sup>

### **Origin of the term Evidence-based**

At 1987, David M. Eddy first used the term "evidence-based" in a workshop. He was asked by the Council of Medical Specialty Societies to teach formal processes for developing clinical practise guidelines. A manual has now been produced by the American College of Physicians. Eddy invented the term 'evidence-based,' which captures the ideas of evidence-based guidelines and population-level policy, in an essay published in the March 1990 issue of the American Medical Association Journal. AD describes the available evidence in relation to the policy and connects it to evidence rather than standard-care procedures or expert beliefs. Evidence that is relevant must be identified, comprehended, and examined.<sup>[4]</sup>

### **The Importance of Evidence-Based Decision Making in Business**

What are the steps of the corporate evidence-based decision-making process?

#### **1. Acquisition/Collection**

- Locating the most up-to-date scientific evidence
- Obtaining the contextual knowledge needed to make a decision
- Make use of stakeholders' expertise and knowledge.

#### **2. Correct Interpretation**

- Considering the study evidence's power in terms of the Continuum's dimensions
- Investigate the perspectives, preferences, and values of local stakeholders who may be impacted by the decision.

### 3. Accurate and right inference

- Consider all three categories of evidence to give yourself the best chance of preventing violence before it happens. [5]

#### What are the Objectives of evidence-based Decision making in the field of Business?

##### Identification of targets

The decision-making process focuses on identifying the goals that the organization wants to achieve. Proper analysis of goals and objectives provides the basis for effective decisions. Decisions are productive and aimless until goals are identified.

##### Proficient consumption of resources

It aims to utilize the resources within the organization by making appropriate decisions regarding their utilization. After in-depth analysis, all decisions are made and implemented, ensuring maximum productivity with minimum waste.

##### Accurate contact

Effective decision-making aims to develop the right communication network to communicate all the information needed at different levels. The flow of correct information regarding the decisions within the organization avoids any confusion and conflict. Employees are highly motivated to participate in decision-making and develop new ideas and facts.

##### Choose the best option

It makes a proper analysis of the various options available to create the best one possible. Decision-makers choose the best course of action to perform the action that gives the maximum results. He uses various analytical tools of finance, statistics, and accounting to determine the right course of action.

##### Business growth

Making the right decision plays a key role in improving the overall growth of a business organization. It helps to

make efficient use of resources by allocating them properly. Businesses can easily face the problems and challenges in the market through quick and rational decisions. It increases business efficiency and ultimately contributes to its growth.

##### Encourages innovation

Each company needs to adapt to changes and innovations in line with market needs to ensure survival. The decision-making process brings a large amount of information into the organization by conducting a variety of analyzes. This information informs management about new ideas and market changes, facilitating innovations by making decisions accordingly. [6]

#### Role of Evidence based decision making in the field of Medicine

##### Evolution and History of Evidence based Medicine:

Evidence Based Medicine is "the use of current best evidence of discretion, clarity, and prudence in making decisions about the care of individual patients." EBM attempts to compile the most up-to-date scientific evidence to help physicians make decisions about patient values, clinical care, and physician experience. The word was first used to teach medical students how to practise medicine and to help doctors make better decisions regarding specific patients.

Dr. Gordon Guyatt, the young McMaster University Internal Medicine Residency Coordinator, established the notion of "Scientific Medicine" in 1990. The word refers to a novel approach of teaching in-bed therapy. [7] Dr. Guyatt built on a Foundation David Socket, his teacher, constructed this bed utilising advanced estimate methods. His coworkers, on the other hand, were kind and welcoming. While present clinical decisions are undoubtedly less than scientific, they are not acceptable. Dr. Guyatt returned with a new title to explain the

residency program's major themes such as "Evidence-Based Medicine." After 1991, the word began to emerge in the ACP Journal Club's editorials. Despite the fact that the word was coined in 1991, it took many years for a new strategy to emerge. Clinical epidemiology, biomedical informatics, and evidence-based guidelines are all covered under Evidence based Medicine.<sup>[8]</sup>

### **Evidence-based guidelines and policies at a glance**

In the 1980s, the American Cancer Society placed a strong focus on impact evidence among evidence-based guidelines and practises. In 1984, the US Preventive Services Task Force (USPSTF) began producing evidence-based guidelines for preventive interventions. The Blue Cross Blue Shield Association establishes strict evidence-based standards for new technology in 1985. Numerous evidence-based guidelines have been written by professional groups such as the American College of Physicians and voluntary health organisations such as the American Heart Association since 1987. Kaiser, a conservation organisation based in the United States, created the Permanent Evidence-Based Guidance Program in 1991. Richard Smith published an editorial in the British Medical Journal in 1991 that popularised the evidence-based approach in the United Kingdom. The Cochrane Collaboration established a network of 13 nations in 1993 to study and prepare guidelines in a systematic manner. The US Agency for Healthcare Research and Quality financed research reports and technical evaluations in 1997 in order to develop research and quality evidence-based learning centres (EPCs). The National Guidelines Clearinghouse, which follows the principles of evidence-based practises, was established in the same year by AHRQ, the American Medical Association, and the American Association of Health Plans. The National Institute for Clinical Excellence (NICE) was established in the United

Kingdom in 1999. Program based on Evidence-based decision making is now available in medical schools in Canada, the United States, the United Kingdom, Australia, and other nations.<sup>[9]</sup>

### **In the late 1980s, the processes for producing unambiguous, evidence-based guidelines were outlined as follows**

1. Formulation of a question
2. Conduct a literature search that will guide to find research that can address the issue.
3. Analyze each study to see what it has to say about the subject; if numerous studies have answered the question, combine their findings (meta-analysis)
4. In the evidence tables, summarise the evidence.
5. On the balance sheet, compare profit, loss, and expense.
6. Describe the most appropriate exercise in detail.
7. Formulate a list of the reasons for seeking advice.
8. Following of the similar procedures in teams and individuals and apply the guidelines.<sup>[10]</sup>

Five phases of EBM in practise were described in 1992 for the objectives of medical education and individual-level decision making, and the experience of delegates attending the 2003 Conference of Evidence-Based Health Care Teachers and Developers was summarised into five steps and published in 2005.

### **This 5-step procedure can be broken down into the following categories**

1. Conversion of ambiguity into a question that can be answered; incorporates critical questioning, study design, and evidence levels.
2. Systematic retrieval of the most up-to-date evidence
3. Internal validity critical appraisal of evidence, which can be divided down into aspects such as:
4. Putting the findings into practice
5. Performance evaluation<sup>[9]</sup>

## **Quality Checking in the field of Evidence based Medicine**

Proof-based medicine classifies numerous types of clinical proof and scores or grades them based on how well they are free of the various biases that plague clinical examination. An ordered assessment of randomised, all around dazed, placebo-controlled preliminary studies with allocation concealment and comprehensive follow-up, including a homogeneous patient population and ailment, for example, provides the most solid proof for helpful mediations.

Interestingly, patient tributes, case reports, and surprisingly well-qualified assessments have little worth as confirmation due to a self-influenced consequence, the inclinations innate in perception and revealing of cases, and hardships in discovering who a specialist is in any case. Few critics have contended that well-qualified assessment doesn't have a place in the rankings of the nature of experimental proof. Since it doesn't address a type of observational proof" and proceed with that "well-qualified assessment would appear to be a different, complex kind of information that would not squeeze into progressive systems, in any case, restricted to exact proof alone. Several organizations have developed grading systems for assessing the quality of evidence. For example, in 1989 the USPSTF put forth the following system.

- Level I - Evidence obtained from at least one properly designed Randomized Controlled Trial
- Level II-1 - Evidence obtained from well-designed controlled trials without randomization
- Level II-2 - Evidence obtained from well-designed cohort studies or case control studies, preferably from more than one center or research group
- Level II-3 - Evidence obtained from multiple time series designs with or without the intervention. Dramatic

results in uncontrolled trials might also be regarded as this type of evidence

- Level III – Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees.<sup>[10]</sup>

## **Concept of Evidence based Dentistry**

As per American Dental Association EBD is as “an approach to oral healthcare that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences.”

## **The three Components of the Definition of Evidence based Dentistry**

- a) The best current research evidence
- b) The clinician’s expertise
- c) The patient’s values and preferences

Scientific evidence, when consistently collected and examined, can offer dentists with useful and up-to-date information. Dentists, on the other hand, do not have enough scientific data to provide proper dental treatment. Dentists should evaluate patients' conditions and desires for results when recommending therapy if necessary. The American Dental Association's EBD Policy Statement includes a description of EBD that outlines the patient's needs in the treatment plan, including the patient's "treatment needs and preferences," social issues, and level of consent with the dentist. Recommendation for therapy was one of the decisions made.<sup>[11]</sup>

Expanding the scientific foundation for clinical care will improve patients' access to better information and have a substantial impact on their oral health care decisions. Patient consent to treatment must fully reveal scientifically confirmed information in evidence-based

clinical practise models. In circumstances where there is no proof of weakening, patients should be notified. The autonomy of dentists may be infiltrated by EBD. By completely providing all of the material examined by the dentist and methodologists, this learning approach safeguards the dentist from legal liability. Dentists utilize knowledge as a tool and object to improve day-to-day decisions in the information age. Systematic reviews can assist dentists in making proper treatment options for their patients.

EBD assists dentists by giving concise scientific abstracts that are easy to understand. Because of the possibility for prejudice, personal experience should no longer be the main source of lifetime dental practice. Furthermore, there is an issue with the lack of consistency in treatment decisions between dentistry and the medical approach. The transition from empirical to evidence-based decision-making benefits the general public and all health-care professions. The evidence-based learning model's main benefit is that it gives less biased, better-verified data on which to base judgments. Many elements of clinical dentistry, however, have inadequate or non-existent scientific support. The American Dental Association is leading the charge to promote clinical and translational research in dentistry as a prominent proponent of science-based oral health care. The American Dental Association (ADA) aims to give relevant information to dentists for use in daily practice and to promote EBD as an oral health care strategy to assure the eventual use of a certain treatment method through its activities.<sup>[12]</sup>

#### **Implications of Evidence based decision making in Government policy making**

- EBDM aids in ensuring that policies are tailored to the actual needs of the community, resulting in improved population outcomes.

- EBDM can emphasize the importance of a problem that requires quick attention. This is critical for gaining funds and resources to design, implement, and sustain policies.
- EBDM allows other members of the public sector to share information about which initiatives have or have not worked. It helps you make better decisions.
- EBDM can help the government save money by redirecting funds away from inefficient and time-consuming policies and activities.
- By enhancing service delivery and community results, EBDM can achieve acceptable returns on financial investments made in public programmes.<sup>[13]</sup>

#### **Evidence-based Decision Making during the era of Covid-19 Pandemic**

As of June 18, 2020, the WHO reported 8,061,550 confirmed cases and 440,290 deaths from certified coronavirus illness (COVID-19) in 216 countries. In the absence of a vaccine, public health measures such as lockdowns and social distance are used to suppress disease epidemics. Various mathematical models were used to investigate the effects of social distance and lockout duration. "Mathematical models are simplified depictions of how an infection spreads over time in a population." To examine the progression of the COVID-19 epidemic, many epidemiological models, such as the "mutually exclusive compartment SIR" model, use structured age data and social interaction scales. The application of scientific evidence in the design of policies and programmes that produce management decisions is the essence of evidence-based decision-making. This epidemic has been going on for a long time, and there is a wealth of information available. The 'Posterior Probability Distribution' can be used to extract information from this data. These distributions serve as the scientific foundation for the next judgement. In a

community, the pattern of disease frequency distribution is a product of cultural habits and social interactions.<sup>[14]</sup>

### Conclusion

The current pandemic's lack of information and generalized anxiety is hacking our decision-making systems in various fields of Medicine, Dentistry, Business fields etc. that produces potential scenarios with more harm than benefits. This is an opportunity to reflect on the need to improve EBM teaching worldwide, change the teaching paradigm to a student-centered and collaborative approach in medical schools, and create a refresher EBM training as part of emergency preparedness for health institutions. We truly believe these strategies could develop critical thinking skills in clinicians in the front-lines and public health decision-makers to critically assess the Evidence even during the stormiest public health problem and follow our oath as a physician – first, not harm.

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