

Evidence-based Dentistry: A Potential Tool for Best Dental Practice

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ABSTRACT

Tried and tested methods exist that are taught throughout the training and course of study for dental students in patient examination and clinical diagnosis. It is impractical to change the entire field of dentistry and abandon the commonly followed techniques that have proved highly efficient and accurate in the past years. However, with the ever-growing advances in the clinical community, it would be prudent to improve our current practices to ensure that clinicians stay up to date with the demands of the dental world, as well as those of the patients, whose awareness is constantly evolving. This can be achieved by using Evidence-Based Dentistry (EBD) as a diagnostic tool and incorporating it into everyday dental treatments and patient interactions. By following the necessary steps and incorporating EBD into dental practices, clinicians can meet patient expectations satisfactorily while maintaining their competency. Practices and dental education establishments can review existing guidelines and become more familiar with the EBD process, paving the way for further improvements in a dentist's skill set and the method itself. EBD has the capacity to bridge the gap between evidence, knowledge, and practical application, thereby attracting more attention in the scientific and clinical arenas. It has the potential to be a game changer, creating a smoother and well-organised workflow. The use of EBD will enhance the world of dentistry, taking it a step further from its current state.

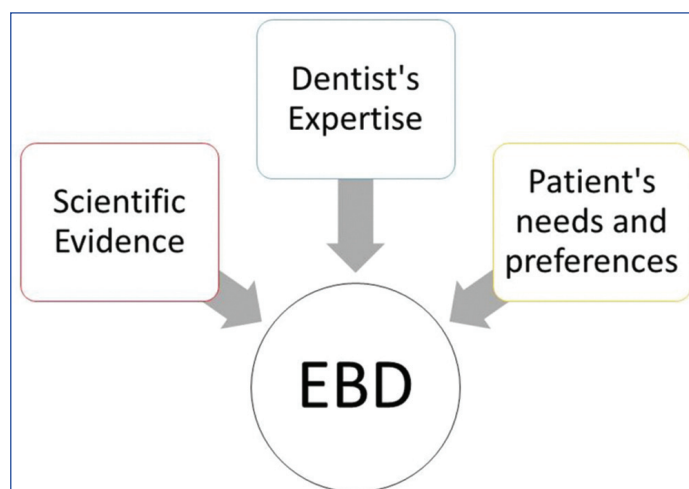
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INTRODUCTION

As a dentist, one's duty is to accurately diagnose a patient's condition and provide an appropriate line of treatment that will result in efficient recovery. This field relies on obtaining all the facts through investigations and applying clinical knowledge to reach the best conclusion. With the fast-paced growth of the industry and frequent advances, even the best clinician would find it difficult to stay on par with the latest information. The abundant online resources available to patients have resulted in the creation of preset expectations of their dentist long before they take a seat in the dental chair. Enter EBD to bridge this gap. Evidence-based medicine has been a concept in the arena of medicine since the 19th century, though the term was only coined in the year 1991 [1]. Not long after, the term was introduced into the field of dentistry in 1999 [2]. EBD was defined by the American Dental Association (ADA) 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 [3].

Pillars of EBD

The three main pillars of EBD are scientific evidence, the dentist's expertise, and the patients' needs and preferences [Table/Fig-1]. Scientific evidence is generally derived from existing research and articles from reliable sources about the various conditions encountered in a dental setup. A dentist's expertise is gained from experience in the field as well as the numerous years of training they have undergone. Finally, the patients' needs and preferences are determined through clear communication and thorough clinical examination. These three factors complete the method of EBD [4]. Through this method, one can limit the numerous outcomes of the chosen treatment plan and narrow the focus towards methods of treatment that will give the best possible outcome [5]. By following predetermined steps, clinicians can simplify the process and apply it systematically in their everyday practice.

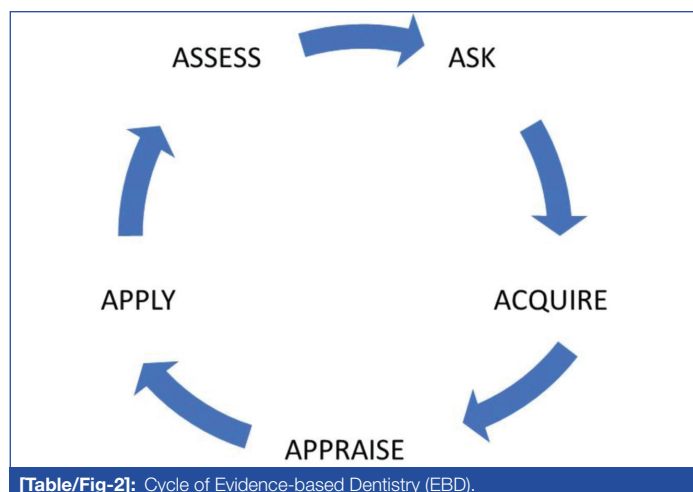


[Table/Fig-1]: The three pillars of EBD.

EBD Cycle

The methods of EBD are simple to understand and easy to apply, which are: ask evidence-based questions, search for and acquire the best current evidence, critically appraise the information, apply the information to the patient's current problem, and finally assess if what is planned is in the best interest of the patient [Table/Fig-2] [6]. These methods can be further simplified into the 5 A's [7]:

Ask: When patients visit a dentist and explain their problems, the clinician can start creating a hypothesis based on the patient's description and further build on this hypothesis upon clinical examination. Questions are often asked according to the Population, Intervention, Comparison, and Outcomes (PICO) framework [8]. The framework can be applied to various aspects of clinical practice, such as therapy [8], diagnosis [9], or any harm related to dental treatment, as well as general external factors considered harmful. A few examples of questions framed under this system are as follows:



[Table/Fig-2]: Cycle of Evidence-based Dentistry (EBD).

1. Example of a question about treatment:

Should a pit and fissure sealant be placed in a child with deep grooves?

- Population: Child with deep grooves in teeth
- Intervention: Pit and fissure sealant
- Comparison: No sealant placed
- Outcome: Chances of reduction of caries formation later in the child's life.

In the above case, the population refers to the patient whom the dentist is treating, while intervention refers to the chosen treatment. Comparison is usually carried out between the different treatment plans that are considered, and the outcome is the final result, which mainly relies on the given treatment, i.e., the intervention [8].

2. Example of a question about diagnosis:

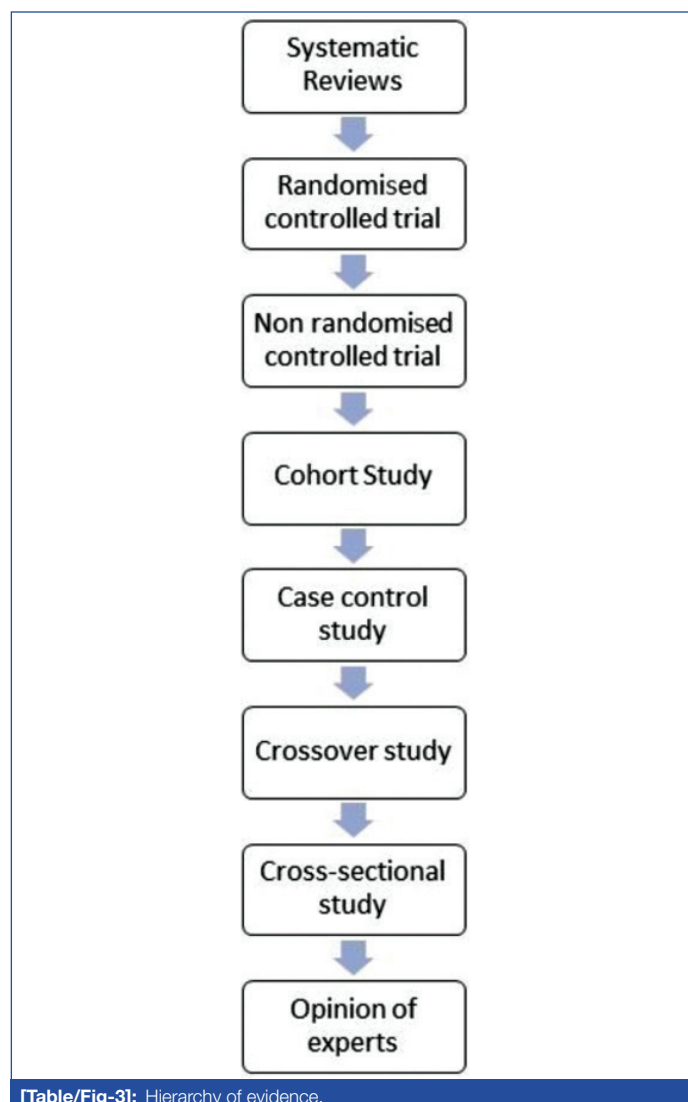
Can caries in deep pits be better detected through fiber optic transillumination? [10]

- Population: Child with deep grooves in teeth
- Diagnostic test: Visible fiber optic transillumination
- Reference standard: Tactile-probe
- Outcomes: True positive, true negative, false positive, false negative

In this case, the population refers to the patients who have come to the office for a diagnosis. Diagnostic tests are the methods chosen to be used as a comparison to the standard references, which are the more traditional ways of arriving at a diagnosis for the patient's condition. The outcomes are based on the accuracy of the chosen diagnostic method [9].

Acquire: This step involves searching for the best possible evidence to support the hypothesis created in the shortest time possible. Scientific evidence is created based on the following types of studies: systematic reviews, Randomised Controlled Trials (RCTs), non-RCTs, cohort studies, case-control studies, crossover studies, cross-sectional studies, case reports, ideas, opinions, and methods of experts in their field as well as colleagues. Based on the various studies, booming resources on the internet, books, numerous journals, and their respective articles, the dentist can easily gather the necessary information. Articles should be chosen appropriately in terms of the updated research that is significant and allows the improvement of the existing standard of care [11]. A convenient source of evidence is systematic reviews. If available, they provide an efficient and easy way of collecting data on the patient's condition [11]. The concept was defined by an organisation called the Cochrane Collaboration. These types of articles should be differentiated from general review articles before being chosen. General review articles may not serve the purpose of providing adequate evidence that is required [12]. Systematic reviews are convenient because they include a collection of data from several

articles based on a single topic, all compiled in one place [13]. By using them as references, the clinician can save a significant amount of time in the acquisition phase, which can then be applied to their decision-making and application phase. The flowchart describing the hierarchy of evidence summarises the acquisition process in EBD [Table/Fig-3] [11,12].



[Table/Fig-3]: Hierarchy of evidence.

Appraise: The evidence found should be critically reviewed to ensure it can be seamlessly applied to the current problem. Upon finding relevant articles, the type of study used to produce the data should be identified. The most common study used to produce articles is usually RCTs because they are one of the top sources of evidence [11,13]. Another type of article that can be referred to is systematic reviews.

Once an article is selected, the following should be considered [8]:

1. Risk of bias: To identify this, a clinician must determine whether the selected study groups began the study under the same factors related to their prognosis. They must also see if the equilibrium of prognosis was retained throughout the entirety of the study until the end. Some ways of reducing the risk of bias that a clinician can look out for are allocation concealment and blinding, also known as masking. It is important to note that studies showing evidence of patient recall and follow-ups on completion generally yield superior results than those that have not done this step [8].
2. Results: The clinician should thoroughly investigate the results of the treatments carried out in their selected article. The impact of the results should be considered carefully to ensure that the use of the methods in the study would be genuinely beneficial to their patient [8].

- Application: Before actually applying the evidence to the case at hand, the clinician should determine, by reading about the results, whether the patients who participated in the study are similar to their case and whether the benefits outweigh the drawbacks [8].

This format of appraisal can generally be used for most types of the studies.

Apply: Once critically appraised, the information is applied in clinical practice. It is highly pertinent that the clinician is not misled by the information provided through their chosen sources. Some steps that can be taken before application include reading the main areas of articles like the abstract, methods, and results sections while avoiding areas like the discussion and conclusions where the authors may include their own opinions or thoughts. Another step that can be applied is looking into articles that have already been critically appraised from evidence-based dental journals [14].

However, regardless of everything else, the most important factor to consider is the patient's needs and preferences. This makes up a very important part of the EBD method. The relevant evidence collected should be discussed with the patient as their well-being is the topmost priority. Sometimes clinicians will encounter a block when the patient expresses their concerns about the chosen course of action. Certain patients may even disagree with the clinician as they are accustomed to a more traditional method of treatment from previous experiences. To avoid this, the dentist may consider looking into recommendations made by certain clinical guidelines to reassure the patient of the application of the chosen evidence [15]. There is a plethora of organisations in the dental community that can provide these guidelines to back up the clinician's decision. Of course, the dentist's experience and knowledge will also come into play, in addition to the gathered evidence and relevant guidelines, if considered. A culmination of all these aspects can make for a well-informed application towards the patient's condition [16].

Assess: The last step is to evaluate the outcomes of the application process and determine whether this collected evidence supports the treatment plan. It is important to acknowledge whether the course chosen was the most beneficial for the patient's condition [5].

Informed consent: After these five steps are taken, the compiled information is explained to the patient in simple understandable language so that the patient can decide on the final course of treatment. This procedure is called 'informed consent'. Informed consent is consent given by the patient after the dentist provides necessary information regarding the required diagnosis and treatment in a language understandable by the patient. The consent discloses that sufficient information is given regarding the prognosis of the condition, proposed treatment, its benefits, alternative treatment, side effects, treatment costs, and the risk of not undergoing treatment [17].

Based on the information given by the dentist, the patient's ability to understand the given information, and after clarifying all doubts, the patient either decides to go forward with the treatment or reject it. Any invasive or irreversible procedure requires informed consent. This is an important tool in any dental practice. It safeguards both the dentist and the patient in ensuring the preservation of individual rights. The consent can be implied, verbal, or written. It is always preferable to have written consent [18].

In the case of children below 18 years of age, as they are not eligible to give consent, parents or guardians can give consent after being informed about all aspects of the procedure. Between 12-16 years, an informed assent form is given, wherein the adolescent is not eligible to sign the consent form but is sufficiently knowledgeable to understand the procedure and can give assent for the treatment procedure [19].

Consent given for one procedure cannot be applied to some other treatment. This consent is to be dated and signed by the patient,

and an independent witness. The name of the patient should be legible on the consent. A copy of the same is given to the patient. This informed consent should be preserved for at least three years. In case of any legal issues, it will be dealt with under the Consumer Protection Act in a consumer court. In case of any legal claims, written informed consent will be the only proof that the dentist had recognised the risks and had informed the patient and the patient had accepted it [20]. A video recording of the informed consent process is also advised. The patient is to be informed about the video recording before beginning the process and should be documented. The process of obtaining informed consent also helps in better communication, building rapport, and improving the quality of treatment [21].

Including a few other factors in clinical practice will enhance the outcome of treatments. One of them is the use of technology in the practice. Whether it is patient management software, technology such as an intraoral camera, or the preparation of casts that allow us to show the probable outcome of the treatment, they can drastically change the relationship between a dentist and patient for the better. Technology has resulted in an improved understanding of the problem by the patient, thereby resulting in better acceptance of treatment and better compliance with the instructions [21].

Practicing EBD may be overwhelming in the beginning if the dentist does not know how to approach the problem at hand. Due to certain factors, at first, it feels like a humongous task to wade through the existing literature and assess the existing information. Once the process is understood, subsequently, it becomes easier, wherein guidelines for each scenario can be prepared beforehand. Updating the guidelines regularly is a must to not miss out on the most recent literature available. This makes it easier to justify treatment decisions in case of any legal issues [22].

Merits of EBD

The process of EBD allows for the elimination of multiple outcomes and allows us to focus on the best possible solutions to a patient's problems [5]. EBD can also help in the elimination or, at the very least, reduction of bias. With a thorough understanding of the concept, a clinician's practice can undoubtedly run at its best performance. In current times, numerous online resources can help make the process easier. With research being conducted through various methods like RCTs, more and more information is being released into the field every day, giving us more solid evidence to back up dental treatments and diagnoses [4]. The final outcome of EBD is the best possible treatment given to the patient based on high-value literature searches, providing increased confidence in the dentist and the right incentive to invest in the best oral healthcare [23].

Demerits of EBD

Though EBD provides dentists with an edge in their dental practice, it comes with many downsides that some clinicians may not be willing to overlook. The process may take time to learn and apply as it involves several steps to achieve results. The current standard of dental education does not prioritise EBD as an important topic or may not cover it at all. Clinicians are therefore not familiar with the process of gathering, critiquing, or applying evidence to their cases [16]. When it comes to gathering evidence, clinicians may find the number of resources overwhelming [24]. It is difficult to determine the reliability of a resource and find applicable evidence in a short amount of time. For many, completely trusting evidence solely from articles would be difficult, and they often rely on tried and trusted methods that they are trained in or have discussed with colleagues and mentors [17]. Another drawback that dentists might encounter is that finding evidence requires allocating specific time for it. It is challenging to manage this along with treating patients and running the practice [25]. The most important aspect to consider above all else is the patient's preference. Often, clinicians may not be able to

carry out a specific treatment plan as the patient may have a different idea of how their treatment should go [26]. It is not always simple to implement sought-out evidence when patients are generally well-informed about their condition beforehand from their family, friends, and the internet, which can sometimes provide conflicting information [4].

CONCLUSION(S)

In today's day and age, we must ask ourselves how we can push the boundaries and become the best diagnosticians and care providers possible. This should be the goal of any practitioner aiming to provide the best patient care. Practitioners often become set in their ways as they establish their practice. It is important for beginners to adopt EBD as early as possible so that it becomes a routine rather than extra work. EBD should be strongly integrated into the curriculum, and students should be trained to make it more comprehensive. They should not only be taught to access scientific articles and interpret them through dental training, but also emphasise the application of this knowledge. Integrating EBD with didactic lectures and clinical training gives an edge to clinical practice. Guides and manuals can be created, and existing ones improved, to reduce the time it takes to gather necessary evidence and evaluate its application. Resources like evidence-based dental journals, the ADA's guidelines and policies on EBD, archives of systematic reviews, and the Cochrane Library of systematic reviews should be made familiar, and their use should be normalised. It is important to motivate the present generation of dentists to adopt this method to ensure success in their practice and achieve satisfactory outcomes for all patients' treatments, no matter how small.

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