

Evidence Based Dental Care: Integrating Clinical Expertise with Systematic Research

MALLIKA KISHORE¹, SUNIL R. PANAT², ASHISH AGGARWAL³, NUPUR AGARWAL⁴, NITIN UPADHYAY⁵, ABHIJEET ALOK⁶

ABSTRACT

Clinical dentistry is becoming increasingly complex and our patients more knowledgeable. Evidence-based care is now regarded as the “gold standard” in health care delivery worldwide. The basis of evidence based dentistry is the published reports of research projects. They are, brought together and analyzed systematically in meta analysis, the source for evidence based decisions. Activities in the field of evidence-based dentistry has increased tremendously in the 21st century, more and more practitioners are joining the train, more education on the subject is being provided to elucidate the knotty areas and there is increasing advocacy for the emergence of the field into a specialty discipline. Evidence-Based Dentistry (EBD), if endorsed by the dental profession, including the research community, may well influence the extent to which society values dental research. Hence, dental researchers should understand the precepts of EBD, and should also recognize the challenges it presents to the research community to strengthen the available evidence and improve the processes of summarizing the evidence and translating it into practice This paper examines the concept of evidence-based dentistry (EBD), including some of the barriers and will discuss about clinical practice guidelines.

Keywords: Evidence based medicine, Dentistry, Dental care, Dental education

INTRODUCTION

The practice of dentistry presents many challenges on a daily basis. Keeping up with new materials and techniques, dealing with the numerous demands of running a small business, and meeting a variety of professional obligations, all compete for our time and attention [1]. As healthcare providers, it is important that physicians and dentists offer the best possible care for their patients. This requires not only a sound educational base but also a good source of current best evidence to support their treatment recommendations [2]. To do it successfully, certain skills need to be obviously acquired, being the intention of evidence-based dentistry the providing better information for the clinician, improved treatment for the patient, and consequently an increased standing of the profession [3]. In many countries, there has been increasing concern about the use of Evidence-Based Practice (EBP) in oral health care [4]. The principles and methods of evidence based dentistry give dentists the opportunity to apply relevant research findings to the care of their patients. The key to finding evidence is to start with a focused, well-built clinical question [5]. Evidence-based oral health care includes the search for the best evidence, critical evaluation of the evidence, and integration of the evidence with the practitioner's experience and expertise. Therefore, dental educators, dental students, and dental practitioners need to be aware of the uncertainties surrounding scientific evidence, the ways that the results of clinical studies are collected and analyzed, and the importance of unbiased research on which to base clinical decision making [6].

A goal of Healthy People 2010 is to promote the oral health of 50% of the nation's children by applying sealants to their molar teeth. Unfortunately, just 32% of children aged 6 to 19 years have sealants. This may be due to the relatively slow translation of current biomedical science into dental practice [7].

The need for valid and current information for answering everyday clinical questions is growing. Ironically, the time available to seek the answers seems to be shrinking. In addition, a surprising amount of published research “belongs in the bin” [8].

Evidence-based dentistry (EBD) closes the gap between clinical

research and real world dental practice and provides dentists with powerful tools to interpret and apply research findings [9]. In dentistry, the evidence-based movement is at a relatively early stage of development. In addition to collating guidelines on effective care, it is critically important to understand what factors will influence dentists' ability to change their clinical practices to incorporate the evidence. Without an understanding of how dentists change their clinical practices, evidence-based dentistry will achieve little [10]. Therefore, it is crucial to implement evidence from research into clinical practice, and by doing this, the concept of EBD can become practically relevant to the dentist [11].

EVIDENCE BASED DENTISTRY

According to Azarpazhooh A et al., Evidence-based practice is a process of lifelong, self-directed learning in which providing health care creates the need for important information about diagnosis, prognosis, treatment, and other clinical and health care issues [12]. The American Dental Association's definition is by far the most comprehensive, as it captures the core elements of EBD. They define it as “an approach to oral health care 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” [13]. It is a widely accepted term in the medical fields around the world. It can be defined as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients” [14].

Evidence-based practice (EBP) is said to be the current best approach to provide interventions that are scientific, safe, efficient and cost effective. The reasons for this are assumed to be through improvements in physicians' and dentists' skills and knowledge, as well as in the communication between patients and their physicians about the rationale behind clinical recommendations made. While studies have attempted to assess the levels of awareness and implementation of EBD amongst various groups of clinicians in different settings, it is not possible to generalize the results to all clinicians [2, 15]. Evidence is based on the existence of at least one well-conducted randomized control trial (RCT) [16]. When asked

about evidence-based practice, general dentists have a problem with the words themselves. The word “base” conjures an image of fundamental change. It implies a change in an essential entity, a foundation, something the practitioner cannot do without. The word “evidence” also causes a problem, because it has not been part of the vocabulary of clinical practice. It may conjure fear, because it relates to legal and regulatory matters. Evidence is what lawyers bring before a judge and jury in the pursuit of truth and justice [17].

CONCEPT OF EVIDENCE BASED DENTISTRY

In understanding the concept of EBD, it is helpful to clarify what it is not. It is not a “cookbook” approach to practice. EBD requires the integration of the best evidence with clinical expertise and patient preferences and, therefore, it informs, but never replaces, clinical judgement. Evidence-based health care recognizes the complex environment in which clinical decisions are made and the importance of individual patient circumstances, beliefs, attitudes and values [17]. Evidence-based practice is a practical approach to clinical problems. It involves tracking down the best available evidence, assessing its validity and using “rules of evidence” to grade the evidence according to its strength [18].

Evidence based dentistry does not mean clinicians abandon everything they learned in dental school. It does not force clinicians to go backwards to justify things the profession universally accepts [19].

GOALS OF EVIDENCE BASED DENTISTRY

Evidence-based dentistry has two main goals: best evidence/research, and the transfer of this in practical use. This involves four basic phases: Asking evidence-based questions (framing an answerable question from a clinical problem); Searching for the best evidence; Reviewing and critically appraising the evidence; Applying this information in a way to help the clinical practice [20]. An additional phase has been suggested that is the evaluation of performance of the techniques, procedures or materials [21]. Evidence-based practice involves tracking down the available evidence, assessing its validity and then using the “best” evidence to inform decisions regarding care. Rules of evidence have been established to grade evidence according to its strength [5].

STEPS IN PRACTISING EVIDENCE BASED DENTISTRY

In traditional dental care, emphasis is placed on the dentist’s accumulated knowledge and experience, adherence to accepted standards, and the opinion of experts and peers. Evidence-based practice, in contrast, places a premium on using current evidence to solve clinical questions [22]. It presupposes two things about the dentist: one, that he or she is conversant with the current literature, and two, that he or she is competent to evaluate it. The first requires that dentists read the scientific literature, particularly in clinical research, and the second requires that they can critically appraise the literature. Niederman and Badovinac [23] identify five steps in clinical decision making that the evidence-based dentist must be involved in:

- 1) Converting clinical information needs into an answerable question
- 2) Using electronic databases to find available evidence
- 3) Critically appraising the evidence for validity and importance
- 4) Integrating the appraisal with the patient’s perceived needs and applying these results in clinical practice
- 5) Evaluating their own performance

AWARENESS OF EVIDENCE BASED DENTISTRY AMONG THE DENTISTS

There have been various studies performed to study the awareness of dentists regarding the evidence based dentistry. In a study done

in Kuwait it was concluded that the overall awareness of EBD amongst dentists was low, even though more than half of them reported that they generally practise it [2].

Similar study carried out among the general dental practitioners currently practising in the North West of England and it was found that only 29% (60/204) could correctly define the term EBP. When faced with clinical uncertainties 60% (122/204) of general dental practitioners turned to friends and colleagues for help and advice. Eighty one percent of respondents were interested in finding out further information about EBP (165/204) [9].

Other studies carried out to evaluate evidence-Based Practice among a group of Malaysian Dental Practitioners and response rate was 50.3 percent [14].

CLINICAL PRACTICE GUIDELINES

Clinical Practice Guidelines (CPGs) are “systematically developed statements to assist practitioners and patients in arriving at decisions on appropriate health care for specific clinical circumstances.” [1].

Evidence-based clinical practice guidelines (EB-CPGs) are structured and formal, and use rigorous, explicit and reproducible methods to assemble and evaluate the evidence. These guidelines are based on systematic reviews and incorporate values and preferences of patients and practitioners. The process of creating a well-developed EB-CPG includes external review and comment by those who will be using the guidelines - for example, a wide range of clinicians, as well as patients or their representatives [24].

The development of EB-CPGs in dentistry is in the beginning stages. A review in 1995 of guideline development by various dental organizations and specialties in the United States revealed a lack of systematic analysis of the literature.

IMPLEMENTING EVIDENCED BASED DENTISTRY IN CLINICAL PRACTISE

Learning involves identifying and evaluating new methods that might improve care and prognosis, determining when to implement those that appear to improve care, and discarding old diagnostics and therapeutics that prove to be unsound [25]. In this information age, it is not uncommon for a patient to rush home from the dentist’s office to look up on the Internet or in health reference texts the drug or diagnosis that was provided. Science in the form of statistical evidence is being introduced into everyday language through advertising [16]. However, some studies have demonstrated that EBD, when taught only in the classroom, may have little impact on the attitudes or behaviors of clinical practitioners. In other words, theoretical knowledge of EBD, obtained without opportunities to practice using an evidence-based approach to patient care decision making, may lead to no changes in dental practice at all. Therefore, it is crucial to implement evidence from research into clinical practice, and by doing this, the concept of EBD can become practically relevant to the dentistry [11].

Although considerable resources are spent on clinical research, little attention has been paid to the implementation of research evidence into clinical care [10]. EBP may not be a concept that every dentist is familiar with, but increasing consumer pressures and the present economic, social, and political changes, will necessarily demand that evidence based principles are implemented [9].

SEARCHING FOR THE BEST EVIDENCE

Practitioners can access computerized bibliographic database such as MEDLINE for references either online via the Internet or in a CD-ROM format [26]. Below are some essential online resources for evidence based research.

PubMed

PubMed is a free medical database provided by the U.S. National Library of Medicine and the National Institutes of Health (NLM). Highly authoritative and up-to-date, PubMed gives you access to

MEDLINE, NLM's database of citations and abstracts in the fields of medicine, nursing, dentistry, veterinary medicine, health care systems and preclinical sciences. Updated daily, Pub Med gives you access to over 14 million citations dating back to the 1950s. Records are indexed using the NLM's Medical Subject Headings (MeSH) [13].

THE COCHRANE COLLABORATION

The Cochrane Collaboration is an international organization whose overall aim is to build and maintain a database of up-to-date systematic reviews of randomized controlled trials of health care and to make these readily accessible electronically. It has been called "an enterprise that rivals the Human Genome Project in its potential implications for modern medicine" [27] and has also been described as being one of the most significant clinical advances since the creation of the National Institutes of Health in the U.S [13].

BARRIERS TO IMPLEMENTING EVIDENCE-BASED CLINICAL PRACTISE

In many countries, there has been increasing concern about the use of evidence-based practice (EBP) in oral health care. The call for the implementation of EBP to increase the effectiveness of dental care seems to face many obstacles [4].

Potential Barriers to Change

1) Environmental: a) In the practice: There are limitations of time and organisation of the practice (for example, a lack of disease registers or mechanisms to monitor repeat prescribing).

b) In education: Due to inappropriate continuing education and failure to connect with program to promote better quality of life. There is lack of incentives to participate in effective educational activities.

c) In health care: Due to lack of financial resources and defined practice populations. Ineffective or unproved activities promoted by health policies. Failure to provide practitioners with access to appropriate information.

d) In society : Due to influence of the media on patients in creating demands or beliefs. There is impact of disadvantage on patients' access to care.

2) Personal

a) Factors associated with the practitioner

Due to obsolete knowledge and influence of opinion leaders (such as health professionals whose views influence their peers) along with beliefs and attitudes (for example, a previous adverse experience of innovation).

b) Factors associated with the patient

There are demands for care by the patient and perceptions or cultural beliefs about appropriate care [28].

A qualitative study was carried out to assess the obstacles among the Flemish (Belgian, Dutch-speaking) dentists experience in the implementation of EBP in routine clinical work. Three major categories of obstacles were identified. These categories relate to obstacles in

- 1) Evidence,
- 2) Partners in health care (medical doctors, patients, and government),
- 3) Field of dentistry.

Their findings suggested that educators should provide communication skills to aid decision making, address the technical dimensions of dentistry, promote lifelong learning, and close the gap between academics and general practitioners (dentists) in order to create mutual understanding [4].

The most common barriers to implementation of early-adopting dentists are difficulty in changing current practice model, resistance and criticism from colleagues, and lack of trust in evidence or research [7].

In an article noted that "dentistry is stunningly inexact science." It is therefore becoming increasingly clear in this "age of Information" that investigative journalism and consumer activism render all clinical decision-making subject to external scrutiny rather than to just professional or peer-review as in the past [29].

CURRENT STATUS OF CLINICALLY RELEVANT EVIDENCE IN DENTISTRY

The translation of research into practice assumes that clinically relevant evidence is available. Unfortunately, in light of the billions of dollars invested in dental research during the last five decades in Europe and the US, the dental research community has paid relatively little attention to clinical aspects of care. Consequently, and contrary to the situation in medicine, there are relatively few randomized controlled trials and other outcomes oriented studies in dentistry that have evaluated clinically relevant interventions. For example, there are no clinical trials that have compared the outcomes of different methods of caries diagnosis using relevant outcome measures. Also, no outcome studies are available for disease-based management of dental caries, periodontal diseases, or facial pain [30].

The evidence needed for evidence-based dentistry must include a broader range of outcomes, including those considered important by patients. For example, a classic definition of appropriateness indicates that treatment is deemed appropriate when the expected health benefit exceeds the expected negative consequences by a sufficiently wide margin that the treatment is worth doing [31].

BENEFITS OF EVIDENCE BASED PRACTISE

There are some advantages of evidence based practice [32] [Table/ Fig-1].

CONCLUSION

Evidence-based dentistry does offer the opportunity for the practice of dentistry to enter a new era, it is worth recalling an old maxim—"the trouble with opportunity is it always comes disguised as hard work." Educators have an important role to play in providing communication skills to aid decision making, addressing the technical dimensions of dentistry, promoting lifelong learning, and closing the gap between academics and general dentists in order to create mutual understanding The ultimate goal would be assisting dental students in learning the skills to practice evidence-based dentistry so that they can provide their future patients with the best clinical evidence and judgment for optimal and cost-effective dental care. There is, therefore, a need to apprise current practitioners on the new method of thinking. Dentistry needs to make strides to keep

EVIDENCE BASED DENTAL PRACTICE ADVANTAGE

YOU

- Gained improved clinical decision making ability
- Achieve greater confidence in treatment planning
- More opportunity to provide treatment choices selected for minimizing risks of harm and maximum treatment safety
- Greater satisfaction derived from creating customized treatment plans based on the powerful combinations of stronger scientific evidence, clinical judgement and experience, as well as patient preferences and value
- More peace of mind that comes from doing right thing
- Increased day to day enjoyment with a happier team motivated by working to a higher standard that puts the patient first in the dental care processes

YOUR PATIENTS

- Most trust and confidence in their doctor and his or her own practice
- Greater incentive to invest in quality oral health care
- Increased pride from being a patient of a community thought leader and distinctive practice

YOUR DENTAL TEAM AND PRACTICE

- Increased staff confidence ,pride, trust and personal satisfaction
- Enhanced recognition in the community and with peers as a thought leader practice
- Greater opportunity to conserve practice financial resources by establishing wiser decisions in product and equipment selection

[Table/Fig-1]: Advantages of evidence based dental practise

pace with the prevailing paradigm of evidence-based care. There is a strong “need for the science behind our treatment decisions”.

REFERENCES

- [1] Sutherland SE. The building blocks of evidence-based dentistry. *J Can Dent Assoc.* 2000 ;66:241-4.
- [2] Haron IM, Sabti MY, Omar R. Awareness, knowledge and practice of evidence-based dentistry amongst dentists in Kuwait. *Eur J Dent Educ.* 2012 ;16:e47-52.
- [3] Ballini A, Capodiferro S, Toia M, Cantore S, Favia G, De Frenza G, et al. Evidence-based dentistry: what's new?. *Int J Med Sci.* 2007;4:174-8.
- [4] Hannes K, Norré D, Goedhuys J, Naert I, Aertgeerts B. Obstacles to implementing evidence-based dentistry: a focus group-based study. *J Dent Educ.* 2008;72:736-44.
- [5] Sutherland SE. Evidence-based dentistry: Part IV. Research design and levels of evidence. *J Can Dent Assoc.* 2001 ;67:375-8.
- [6] Crawford JM, Briggs CL, England CG. Publication bias and its implications for evidence-based clinical decision making. *J Dent Educ.* 2010 ;74:593-600.
- [7] Spallek H, Song M, Polk DE, Bekhuis T, Frantsve-Hawley J, Aravamudhan K. Barriers to implementing evidence-based clinical guidelines: a survey of early adopters. *J Evid Based Dent Pract.* 2010 ;10:195-206.
- [8] Sutherland SE. Evidence-based dentistry: Part V. Critical appraisal of the dental literature: papers about therapy. *J Can Dent Assoc.* 2001;67:442-5.
- [9] Iqbal A, Glennly AM. General dental practitioners' knowledge of and attitudes towards evidence based practice. *Br Dent J.* 2002 ;193:587-91.
- [10] McGlone P, Watt R, Sheiham A. Evidence-based dentistry: an overview of the challenges in changing professional practice. *Br Dent J.* 2001;190:636-9.
- [11] Faggion CM Jr, Tu YK. Evidence-based dentistry: a model for clinical practice. *J Dent Educ.* 2007;71:825-31.
- [12] Azarpazhooh A, Mayhall JT, Leake JL. Introducing dental students to evidence-based decisions in dental care. *J Dent Educ.* 2008 ;72:87-109.
- [13] Rabb-Waytowich D You ask, we answer: Evidence-based dentistry: Part 1. an overview. *J Can Dent Assoc.* 2009;75:27-8.
- [14] Yusof ZY, Han LJ, San PP, Ramli AS. Evidence-based practice among a group of Malaysian dental practitioners. *J Dent Educ.* 2008;72:1333-42.
- [15] Haj-Ali RN, Walker MP, Petrie CS, Williams K, Strain T. Utilization of evidence-based informational resources for clinical decisions related to posterior composite restorations. *J Dent Educ.* 2005;69:1251-6.
- [16] Beyers RM. Evidence-based dentistry: a general practitioner's perspective. *J Can Dent Assoc.* 1999;65:620-2.
- [17] Browman GP. Evidence-based paradigms and opinions in clinical management and cancer research. *Semin Oncol.* 1999;26:9-13.
- [18] Sackett DL. Rules of evidence and clinical recommendations for the management of patients. *Can J Cardiol.* 1993 ;9:487-9.
- [19] Goldstein GR. What is evidence based dentistry? *Dent Clin North Am.* 2002; 46:1-9, v.
- [20] Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ.* 1996 ;312:71-2.
- [21] Carr AB, McGivney GP. Users' guides to the dental literature: how to get started. *J Prosthet Dent.* 2000 ;83:13-20.
- [22] Coulter ID. Evidence-based dentistry and health services research: is one possible without the other? *J Dent Educ.* 2001 ;65:714-24.
- [23] Niederman R, Badovinac R. Tradition-based dental care and evidence-based dental care. *J Dent Res.* 1999;78:1288-91.
- [24] Jadad A. From individual trials to groups of trials: reviews, meta-analyses and guidelines. Randomized controlled trials. London: BMJ Books; 1998. p. 78-92.
- [25] Marinho VC, Richards D, Niederman R Variation, certainty, evidence, and change in dental education: employing evidence-based dentistry in dental education. *J Dent Educ.* 2001;65:449-55.
- [26] Nainar SM. Evidence-based dental care-a concept review. *Pediatr Dent.* 1998; 20:418-21.
- [27] Naylor CD. Grey zones of clinical practice: some limits to evidence-based medicine. *Lancet.* 1995;345:840-2.
- [28] Haines A, Donald A. Making better use of research findings. *BMJ.* 1998;317:72-5.
- [29] Ecenbarger W: How honest are dentists? *Reader's Digest* 150:50-56, February, 1997.
- [30] Dickersin K, Manheimer E. The cochrane collaboration: evaluation of health care and services using systematic reviews of the results of randomized controlled trials. *Clin Obstet Gynecol.* 1998;41:315-31.
- [31] Bader J, Ismail A, Clarkson J. Evidence-based dentistry and the dental research community. *J Dent Res.* 1999;78:1480-3.
- [32] Merijohn GK, Bader JD, Frantsve-Hawley J, Aravamudhan K. Clinical decision support chairside tools for evidence-based dental practice. *J Evid Based Dent Pract.* 2008;8:119.

PARTICULARS OF CONTRIBUTORS:

1. Post Graduate Student, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.
2. Professor and Head of Department, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.
3. Senior Lecturer, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.
4. Senior Lecturer, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.
5. Senior Lecturer, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.
6. Post Graduate Student, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Mallika Kishore,
Post Graduate Student, Department of Oral Medicine and Radiology, Institute of Dental Sciences, Bareilly, UP, India.
Phone: 09719858806, E-mail: dr.mallika.kishore01@gmail.com

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