

# Evidence-based Education System: Self-reflection and a Case Study from an Undergraduate Medical Student of Sumandeep Vidyapeeth

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## Abstract

**Prologue:** Evidence-based medicine is a medical technological advancement which promulgates decision-making for the care of individual patient which is scientific, proven, evidence-based, recent, and rational. This is possible because of the advancement in information generation and dissemination technology. **Aim and Objective:** The aim of the study was to generate evidence; this learning experience is presented. This research article is a case study and self-reflection of my experiences which has evolved in the stepwise fashion of my learning experience through a system of Evidence-based Education System (EBES). **Methodology:** Qualitative as well as quantitative assessment of EBES is done by sharing my experience, as a medical student of the past 4 years at Sumandeep Vidyapeeth deemed to be University. A detail examination of the system, the role of the teacher/facilitator, and its components are studied and presented. **Results:** It was a difficult concept for a novice; however, overtime, I started solving jigsaw puzzle inform of grasping medical concepts better. My concept of textbook and class room learning was metamorphosed in additional learning in the form of problem-based learning and raising a query for better understanding. I started understanding classroom lectures better when certain terms were used by the medical teacher such as “RCT,” “PICO analysis,” “Meta-analysis,” “Level of evidence,” “Class of recommendation,” and “Cochrane review”. **Conclusion:** EBES is a novel system which encompasses a vista of principles of evidences in the whole teaching–learning process which is interwoven in the curriculum in a manner which has benefited me and also will benefit other medical students.

**Keywords:** Evidence-based education system, evidence-based medicine, PICO analysis, RCT

## INTRODUCTION

Technological advances in conceptual thinking as well as their application in medical science and education have led to great benefit in decision-making in relation to the care of a patient. A “system” which has helped in the learning process based on the principles of “Evidence Based Medicine (EBM)” adopted in the curriculum at Sumandeep Vidyapeeth (Deemed to be University) is coined as Evidence-based Education System which is popularly coined in the form of acronym, EBES. Technological advancement has resulted in medical practice based on the EBM, which helps in decision-making for care of individual patient. Practice based on it is scientific, proven, recent, rational, and most important evidence based. The clinical skill developed hitherto is evidence-based practice (EBP) which integrates the best available external

clinical evidence from systematic research with individual clinical expertise.

EBES is one of the novel concepts based on the generation of evidence,<sup>[1,2]</sup> evidence searching,<sup>[3]</sup> and application of this learning process into practice.<sup>[4]</sup> EBM is a revered tool used all over the world for betterment in clinical decision-making. How to generate evidence (research and PICO process), how

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to search evidence (Right one, Search engines, and Keywords, and grades of evidence), and how to apply this evidences in the practice (critical appraisal and meta-analysis) once you are equipped with degree from the medical university is imparted at Sumandeep Vidyapeeth through EBES process.

A case study is one of the research methodologies which involves a detail examination of a subject (EBES in this study) with in-depth study and comprehensive analysis. The study of a particular subject or a case may be related to contextual conditions. This self-reflective study on EBES is presented with background factors of the learning process which was done by me in stepwise fashion. The study result is expressed not only with numerical/quantitative data but also with qualitative research inputs.

## METHODOLOGY

A case study method is used for presenting my experience of “EBES” which is done as a part of the MBBS curriculum at SBKS Medical Institute and Research Center situated at Piparia, District Vadodara, Gujarat, India

Analysis and narration of my experience of EBES, a system of learning–teaching method which is incorporated in various activities of the UG and PG curriculum, both in theory teaching and practical posting, is contemplated and presented. EBM is a separate subject during the MBBS curriculum and it is also integrated with regular teaching of undergraduate/postgraduate Medical, Dental, Nursing, Physiotherapy, and health management streams of Sumandeep Vidyapeeth which is declared as an Institution Deemed to be University (U/S 3 of UGC Act 1956 Accredited – NAAC “A” Grade).<sup>[5]</sup> The research question which was put was “Is this system gives effective benefit to a medical student?” How best the system

according to a medical student is was an issue to be scrutinized. Feedback of a student will stand high value was one of the hypotheses based on which this study is performed. This case study is of period of the past 4 years. A detail examination of the system, the role of the teacher/facilitator, and its components are studied and presented. The results are expressed in the form of different components of EBES, as my study progressed from the first-year MBBS through the third-year MBBS, how the assessment was done (formal/nonformal), resultant outcome of the assessment and most important was how it helped me in my academic career is narrated.

## RESULTS

### Results are described in the following order

- The stepwise curriculum component of EBES in the first-, second-, and final-year MBBS and the experience and outcome of my learning of the past 4 years which is described in Table 1. Stepwise teaching/learning starts with the simple framing in the first-year MBBS to a detailed query in the third-year MBBS. Community-based research assignment is given in short batches in the third-year MBBS [Table 1]
- Outcome/benefit in my academic career and participation in another academic program because of my insight to EBES [Table 2]
- Various components of EBES-related activity done at our University [Table 3]
- The role of the teacher/facilitator in EBES and my feedback [Table 4].

## DISCUSSION

Terms such as EBES, EBM, evidence-based dentistry, and EBP centers are around the word “EVIDENCE.” The

**Table 1: Year of MBBS study, Stepwise learning process of evidence-based education system, formal and periodic assessment, outcome, and comments**

Year of study	Learning process involved with other batch mates	Learning process involved as an individual student	Type of assessment	Remark by the project head and university exam grade
First-year MBBS	Introduction and orientation to EBES EBM lectures correspond to subject's anatomy, physiology, and biochemistry Introduction to PICO format and utilization of searching tools such as Medscape, PubMed Evidence-based assignment	EBM project was done on “Case study of Breast Carcinoma” in the 1 <sup>st</sup> year MBBS given by the anatomy department EBM project was done on active and passive immunity given by the physiology department	Was on the basis of EBM assessed by Anatomy Department, SBKS MIRC, and Sumandeep Vidyapeeth Was on the basis of EBM assessed by Physiology Department, SBKS MIRC, and Sumandeep Vidyapeeth	Excellent work done A
Second-year MBBS	EBM lectures correspond to subject's Microbiology, Pharmacology, Pathology and Forensic Medicine	EBM project was done on case study of Hypertension given by pharmacology department	Was on the basis on EBM assessed by (Pharmacology Department, SBKS MIRC, Sumandeep Vidyapeeth)	Very good work presented B+
Third-year MBBS	EBM lectures correspond to subject's Ophthalmology, ENT as well as PSM	A cross-sectional study on the food vendors selling food in urban and peri-urban area of Vadodara city given by PSM dept EviGenCHIP research project	Was on the basis of EBM assessed by (PSM Department, SBKS MIRC, Sumandeep Vidyapeeth)	Very good job. Well Done B+

PSM: Preventive and social medicine, EBM: Evidence based medicine, EBES: Evidence-based Education System, Smt. B.K.Shah Medical institute & research centre (SBKS MIRC)

keyword “evidence” is basic for any stream of science, its genesis in medicine as EBM started in the mid-19<sup>th</sup> century.<sup>[5]</sup> Internationally, EBM as a recognizable movement and has

become a hot topic for clinicians, health-care worker, health policy-makers, and the public at large.<sup>[5]</sup> EBM is a medical technological advancement which relates to decision-making for the care of individual patient in narrow terms; however, it has wide applicability in the community.<sup>[5]</sup>

**Table 2: Extra academic projects (Inspired because of the Evidence-based Education System learning)**

Extra academic activities	Project/paper/poster title	Sponsor/conference/event name
1	Emerging and Reemerging infectious diseases of India: A Review of recent literature	Medicon 2016
2	Effects of a living modified organism on health: A Review article	ISCON-2016
3	Postdemonetization - Impact on health and medical services	Amcon 2017
4	The study of perception about health insurance schemes: A doctor as a service provider's perspective	ICMR STS 2018
5	Which wing of autonomic nervous system is more affected in diabetes mellitus: Sympathetic or parasympathetic?	Assopicon-2018

Most medical institutes have accepted as one of the most important facets in clinical decision-making, and this new paradigm for medical practice and teaching is emerging.<sup>[6]</sup> It should be part of medical residency program and in the formal medical curriculum.<sup>[6,7]</sup> In India, the practice of EBM is very important at an individual patient level and also for the community, as it is one of the most populous countries in the world. There is large patient population having poverty and illiteracy; health expenses by an individual person, society, organization, and government on any intervention (drugs and procedures) which has not proven to be efficacious may lead to an unacceptable proposition of economical and human resource waste.<sup>[7]</sup>

Doctors being a key role player in any capacity, a clinician, health administrator, head of the medical organization, or a part of governmental policy-maker, one should be oriented to EBM. Unhealthy practices done by an individual doctor or

**Table 3: Various components of evidence based education system of Sumandeep Vidyapeeth**

Components of EBES of sumandeep Vidyapeeth	Ethos
EviGenCHIP program	In third-year MBBS, (part one), the students have a community-based project known as “EviGenCHIP - Evidence generating community health intervention project”
Evidence based JC	Various departments in Sumandeep Vidyapeeth conduct Evidence-based JC. It has impact on clinical practice and a student learn critical reading skills and critical appraisal of a research paper
Evidence based protocols	Evidence-based protocols are prepared by all the clinical departments such that a standard treatment protocol can be adopted. These protocols are prepared by a team of senior and expert doctors and followed by resident doctors and taught to undergraduate students in theory and practice
Evidence based lectures	Class room lectures of different subjects such as anatomy, physiology, microbiology, dermatology, and surgery are integrated and evidence are incorporated which are known as evidence-based class room lectures. During classroom didactic lectures, the EBM approach is interwoven, and student is made to understand tailor-made decision-making
Evidence based ward rounds	Teaching during round will involve evidence-based search for treatment plans
A separate lecture series on Ebess subject	Separate lectures are meta-analysis, Some statistical terms such as confidence interval, (NNT arranged for EBES subject which would make a student understand EBES terminology such as PICO analysis, RCT, Forest Plot, Cochrane Review) and others

EBES: Evidence-based Education System, JC: Journal club, EBM: Evidence based medicine, RCT: Randomized Control Trial, NNT: Number needed to treat, RCT: Randomized controlled trial, PICO: P-patient problem or population, I- Intervention, C- comparison, O- outcome

**Table 4: Role of teacher/facilitator in Evidence-based Education System and my feedback of Evidence-based Education System (Verbative: Qualitative data)**

Role of teacher/facilitator in EBES	My Feedback of EBES (Verbative: Qualitative data EBES)
Teachers at Sumandeep Vidyapeeth were trained by international trainers through training at apex institutes of India and during two international EBES conferences sponsored by Sumandeep Vidyapeeth. These trainers became facilitator for other teachers. There are periodic training sessions arranged by University for new teachers who are new recruits. There are trained for incorporating “Evidences” in their classroom lectures. Department has lecture-bank for EBES lectures which are updated by newer evidences time to time.	Initially I had difficulty in understanding concept of EBES, but later on, I was able to grasp it faster and better. Newer concepts of medical education such as “problem by teaching/learning” “Case based research study” was acquired by me. Starting raising research questions and was able to find answers by evidence-based search. I started understanding classroom lectures better when certain terms were used by the medical teacher such as RCT, PICO analysis, meta-analysis, level of evidence, class of recommendation, and Cochrane review. I understood non EBES lectures better and of course EBES lectures gave me foundation. I was able to do self-study better.

EBES: Evidence-based Education System, RCT: Randomized controlled trial, PICO: P-patient problem or population, I- Intervention, C- comparison, O- outcome

an organization may be due to the lack of information or the reason which we feel is due to conventional teaching imparted from medical schools. EBM is one of the solutions to curb poor quality care.

EBM was a nonstarter in India;<sup>[7,8]</sup> Sumandeep Vidyapeeth has taken a stand to teach EBM principles from day 1 of a medical student life history and percolate idea to the student community of medical and paramedical sciences. As documented in “Results” portion, various components of EBES of Sumandeep Vidyapeeth are EviGenCHIP program, evidence-based journal club (JC), evidence-based protocols, evidence-based Lectures, evidence-based ward rounds, and others. All students of SBKS Medical Institute and Research center of Sumandeep Vidyapeeth are familiarized with “EviGenCHIP” program. It is acronym for “Evidence generating community health intervention project.” In the era of computers and electronics, the use of word “chip” is very apt. This academic chip, “EviGenCHIP,” is related to evidence generation in medico-electronic era. The idea of this program is to orient undergraduate medical students to community work and to familiarize them to community at an early stage which is needed for a basic doctor.<sup>[9,10]</sup>

At the postgraduate departmental level of Sumandeep Vidyapeeth, evidence-based JC which is one of the integral parts of the medical curriculum is carried out regularly. Critical appraisal and discussion of research articles are done to abreast with the current medical literature and recent concepts. Skills like of evidence-related appraisal, searching-related latest evidences, grading evidence, and evaluating quality of research are acquired through it. It has an impact on clinical practice, and a student learns critical reading skills of the research paper.<sup>[11,12]</sup>

EBM stresses on using the clinical expertise to combine the best available evidence with patient values to aid clinical decision-making.<sup>[13]</sup> Evidence-based protocols are prepared by clinical departments, taking in consideration evidence-based treatment guidelines of apex organization, integrated with local and institutional needs. Treatment recommendation backed up by evidence (which is graded) can be applied to the whole globe; however, infrastructural facility, different ethnic population group, and available expertise may vary from place to place. This was the reason for institutional-based protocol.

There is a need of much more to be done as a section of medical professionals who shy away from it with a myth that there are complexities and use of statistics terms in EBM. One of the components of the curriculum is to impart the knowledge to students of Sumandeep Vidyapeeth; this thought to be “complex” terminology and statistical methods of EBM. Special lecture series is prepared where a student is familiarized with terms such as “RCT,” “PICO analysis,” “Meta-analysis,” “Level of evidence,” “Class of recommendation,” and “Cochrane review”. Practical training in the form of teaching during round which involves evidence-based search for treatment plans also makes them ease with regard to myth of

complexity of EBM. Many conflicting situations in treating patient conditions or planning for laboratory investigation can be solved at bedside by such discussion. Students and patients may initially feel odd when search is made from smartphones, but then, these skills make them more confident about treatment and management strategy which encompasses patient’s preference also.

Teaching the concepts of EBM to medical students and residents is a need of today’s world. Sumandeep Vidyapeeth has incorporated EBM concepts in the medical education system in the form of EBES which may help students to learn more rational and scientific medicine.

## CONCLUSION

If EBM is practiced in medical colleges, students would be exposed to research and publication at an early stage which happened in my case. The project also served as prime for other research projects which student can undertake.

-EBES is a novel system which encompasses a vista of principles of evidences in the whole teaching–learning process which is interwoven in the curriculum in a manner which has benefited me and also will benefit other medical students.

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## Conflicts of interest

There are no conflicts of interest.

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