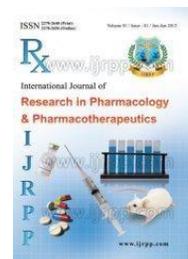




## International Journal of Research in Pharmacology & Pharmacotherapeutics



ISSN Print: 2278-2648  
ISSN Online: 2278-2656

IJRPP |Vol.4 | Issue 1 | Jan-Mar-2015  
Journal Home page: [www.ijrpp.com](http://www.ijrpp.com)

Research article

Open Access

### Introducing an evidence based medicine course to second year medical students-evaluating its effectiveness and student feedback

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#### ABSTRACT

**Objectives:** To study the effectiveness of Introducing an Evidence Based Medicine (EBM) course in the curriculum of Second Year Medical Students and to obtain their feedback regarding the same.

**Methods:** 66 students consented and participated in the study. EBM was introduced as a series of 6 lectures of different topics including basic biostatistics and framing of clinical question. A couple of hands on sessions regarding efficient searching of Medline for evidence and critical appraisal of research studies were also conducted. As a part of the course students were asked to download an original research article and critically appraise it using a checklist provided to them. Fresno test of competence in EBM was used to assess EBM knowledge and skills before and after the course. Differences between pre and post test scores were statistically analyzed by chi square and Student t-test.

**Observations:** The students showed significant improvement in their post test scores. The student feedback regarding the course was positive and encouraging. 57(86%) of the students felt that the course helped them in the understanding of the principles of EBM and that it also increased their ability to search for new information more efficiently. 46(70%) of them agreed that EBM should be included in their regular MBBS curriculum.

**Conclusion:** The course was effective in improving the student knowledge and skills regarding EBM. It was also positively accepted by the students and most of them found it to be useful, informative, interesting and relevant.

**Keywords:** Evidence based medicine, medical students, educational intervention, medical education

#### INTRODUCTION

The process of Evidence Based Medicine (EBM) includes formulating a structured question arising

from specific clinical problem, searching the literature and acquiring evidence, appraising the evidence for quality and, if found valid, relevant and

appropriate, applying the findings taking into account patient's own preferences and values.<sup>[1]</sup>

It has been suggested that one of the ways to ensure our medical graduates are ready for future, is to train them in the necessary skills to support life-long learning through the five step model of EBM.<sup>[2]</sup>

Recognising the importance of EBM in patient care it has been increasingly incorporated in the medical curriculum, although to a limited extent in some places,<sup>[3]</sup> including India.

Presently the question is not whether EBM can be taught, but how to teach it well.<sup>[4]</sup> Didactic teaching alone is unlikely to result in desired outcomes. Therefore educational activities with an interactive format should be planned and undertaken for effective learning of EBM to take place.<sup>[5]</sup>

The present study was undertaken to evaluate the effectiveness of introducing an EBM course by using student centered, active teaching, and learning educational interventions in order to facilitate EBM learning among second year medical students when compared to passive didactic lecturing and to obtain student feedback regarding the same.

## MATERIALS AND METHODS

This was an interventional study carried out in a reputed medical college in southern India, among second year medical students. 66 students consented and participated in the study. The EBM Course was introduced to the students with little or no prior knowledge of evidence based medicine as a series of 6 lectures wherein the students were made aware of EBM and its principles (for example, identification of problems, formulation of a structured question in PICO format, critical appraisal, hierarchy of research evidence, searching for evidence, quantitative estimates of risk, benefit and harm, confidence interval, statistical and clinical significance etc). Immediately after the lecture series, Fresno test of EBM competence, a validated test of competence in evidence-based medicine, was administered to the students in order to assess their learning of EBM. This was followed by 2 hands on training sessions regarding productive and efficient searching of Medline and pubmed for evidence and critical appraisal of research studies of 2 hours duration each. As a part of the course, self study was encouraged wherein the students were asked to download an

original research article related to clinical pharmacology and therapeutics and critically appraise it using a checklist provided to them and this had to be submitted within a week. This was followed by a post test using the Fresno test of competence in EBM.

All the questionnaires were graded by the corresponding author. The grading system of the Fresno test was adapted and modified according to our convenience and requirement. Answers were assigned a score of 0 (inadequate skill) or 1 (adequate skill). For example, to answer the first question the students had to write a focused clinical question based on the PICO format. To receive a score of 1, they needed to include the four key components of a focused clinical question: patient population, an intervention, a comparison group, and a measurable outcome. Scores from individual questions were added to determine the total score of EBM skills as was done in a previous study.<sup>[6]</sup>

Since Fresno's test of competence in EBM is designed to measure the knowledge and skills related to EBM. The attitude of students towards EBM and their feedback regarding the course was assessed additionally by another questionnaire administered after the posttest.

The results were expressed as Mean±SD. Differences between pre and post test scores were statistically analyzed by Student t- test and chi square test.  $p < 0.05$  was considered as statistically significant.

## RESULTS

The students showed significant improvement in their post test scores. (Table 1) Their ability to calculate the quantitative parameters like absolute risk reduction, relative risk reduction and number needed to treat and their awareness regarding literature search in a productive and time efficient manner was found to be better after the interactive, hands on sessions and self learning. (Table 2) The student feedback regarding the course was positive and encouraging. 57(86%) of the students felt that the course helped them in the understanding of the principles of EBM and that it also increased their ability to search for new information more efficiently. 46(70%) of them agreed that EBM should be included in their regular MBBS curriculum. (Table 3)

**Table 1. Mean knowledge score of the Students.**

	Mean $\pm$ S.D	Pre test Vs Post test (t' value)
Pre test	2.56 $\pm$ 1.63	9.19
Post test	7.04 $\pm$ 3.14	p<0.0001

**Table 2. Awareness and Performance of students**

	Pre test	Post test	' $\chi^2$ value	p value
1. Aware of PubMed as source of information	19	31	7.74	0.005
2. Aware of PubMed- search strategy	15	37	20.73	<0.0001
3. Ability to calculate ARR, RRR, NNT	08	51	67.08	<0.0001

ARR- Absolute risk reduction, RRR- Relative risk reduction, NNT- Number needed to treat

**Table 3. Students Feedback regarding EBM Course**

Students Feedback	Intervention group (%)
1.The course helped me understand the principles of EBM	57(90)
2. EBM course was	
-Useful	44(70)
-Informative	54(86)
-Interesting	34(54)
-Relevant	47(75)
3. EBM course increased my ability to search for new information on the internet more efficiently	57(90)
4. EBM course helped me learn to read and appraise scientific research articles	51(81)
5.EBM should be compulsorily included in Our MBBS curriculum	46(73)
6. The older text book method of practicing medicine is better and efficient than EBM	
-Agree	06(10)
-Unsure	23(36)
-Disagree	34(54)

## DISCUSSION

The EBM course was introduced to second year students as we felt that 2<sup>nd</sup> year may be an ideal time for the students to get to know about the principles of

EBM and develop the essential skills related to it and it can encourage critical thinking about therapeutic and diagnostic decisions that the students may come across during their third and fourth year clinical

rotations. Many studies have described the teaching of EBM to third and fourth year medical students, but introducing EBM in the later part of the medical studies during the 3<sup>rd</sup> and 4<sup>th</sup> year may be difficult as the demands of the final year are too high. Few studies have successfully introduced EBM during the first year as well.<sup>[7]</sup>

Adding EBM to medical curricula will help the students to develop EBM skills from the outset of their clinical training and helps them to practice confidently using EBM skills in their future career.<sup>[8]</sup>

The practice of EBM demands a set of skills like retrieval of medical literature, its critical appraisal and applying the current best evidence.<sup>[9]</sup>

Introducing EBM in the form of lectures alone may not result in the acquisition of the desired learning outcomes as was seen in our study. Additional educational interventions in which the students take an active participation in learning is more likely to result in the acquisition of EBM competence.

Changes in attitudes are likely to be important in bringing about sustained changes in behavior, which is what will ultimately result in better patient care.<sup>[5]</sup>

Our participants realized the importance of EBM in patient care and 73% of them felt that EBM should compulsorily be made a part of their medical curriculum and 54% of the participants felt that EBM is a better method of practicing medicine.

Clinical decision making is a much broader activity which requires inputs that are not usually the focus of EBM teaching like patient preferences, costs, ethical considerations, and other features of the health care delivery system<sup>[10]</sup> Hence patient-focused EBM

education wherein these aspects are also given importance should be incorporated.

Our EBM course was found to be an effective tool which facilitated the learning of EBM. But by the time the students enter their internship they might not remember most of it. Hence EBM principles if reinforced during this period may find a place in the long term memory of the participants.

Evaluation of any educational intervention consists of at least four dimensions: satisfaction of participants, learning (knowledge and skills), change in attitude or behavioral change (transfer of knowledge and skills to workplace), and outcomes (impact on patients).<sup>[11]</sup>

Our study assessed the effectiveness of the educational intervention in facilitating the learning of EBM, the participants' attitude towards EBM and their feedback regarding the EBM course. The long term retention of EBM principles and application of those principles during their clinical rotations were not assessed. Future studies may be undertaken, keeping these aspects in mind.

To conclude, our EBM course was effective in improving the student knowledge, skills and attitude regarding EBM. It was also positively accepted by the students and most of them found it to be useful, informative, interesting and relevant. The feedback from involved teaching faculty was encouraging as well.

## ACKNOWLEDGEMENTS

We would like to acknowledge the students for their consent to be a part of this study and their dedication, motivation and enthusiasm during the study.

## REFERENCES

- [1] Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS: Evidence based medicine: what it is and what it isn't. *BMJ*, 1996; 312(7023):71-2.
- [2] Dawes M et al. Sicily statement on evidence-based practice. *BMC Medical Education* 2005, 5:1.
- [3] Chan GC, Teng CL. Primary care doctors' perceptions towards evidence based medicine in Melaka State- A questionnaire study. *Med J Malaysia* . 2005; 60( 2 ):130-33.
- [4] Hatala R, Guyatt G. Evaluating the teaching of Evidence based medicine. *JAMA*. 2002; 88(9): 1110-12.
- [5] Khan KS, Coomarasamy A. A hierarchy of effective teaching and learning to acquire competence in evidenced-based medicine. *BMC Medical Education* 2006, 6:59.
- [6] Dinkevich E, Markinson A, Ahsan S, Lawrence B. Effect of a brief intervention on evidence-based medicine skills of pediatric residents. *BMC Medical Education* 2006, 6:1.
- [7] Srinivasan M, Weiner M, Breitfeld PP, Brahmi F, Dickerson KL, Weiner G. Early introduction of an evidence - based medicine course to preclinical medical students. *J Gen Intern Med*. 2002; 17:58-65.

- [8] Tamim H M, Ferwana M, Al Banyan E, Al Alwan I, Hajeer AH. Integration of Evidence Based Medicine into a Medical Curriculum. *Med Educ Online* [serial online] 2009;14:15, 1-5.
- [9] Taheri H , Mirmohamadsadeghi M, Adibi I, Ashorion V, Sadeghizade A, Adibi P. Evidence-based Medicine (EBM) for Undergraduate Medical Students. *Ann Acad Med Singapore* 2008;37:764-8.
- [10] Schwartz A, Hupert J. Insights from Teaching Evidence-Based Medicine. *Virtual Mentor*. 2011, 13(1): 21-24.
- [11] Fritsche L, Greenhalgh T, Falck•Ytter Y, Neumayer HH, Kunz R. Do short courses in evidence based medicine improve knowledge and skills? Validation of Berlin questionnaire and before and after study of courses in evidence based medicine. *BMJ*, 2002; 325 (7), 1338-41