

MEDICAL LIBRARIANS AS DEVELOPERS OF E-LEARNING COURSES IN EVIDENCE BASED PRACTICE



Helena BOUZKOVA¹, Jarmila POTOMKOVA², Eva LESENKOVA¹
¹National Medical Library, Prague, Czech Republic
²Palacký University Medical Library, Olomouc, Czech Republic
 E-mail: bouzkova@nlk.cz

INTRODUCTION

Evidence based practice (EBP) plays a key role in translational medicine because it contributes to the implementation of biomedical research results to clinical practice, undergraduate and life-long medical education. A 20-year-history of evidence based medicine has confirmed that health sciences librarians and information specialists occupy an irreplaceable position in the process of searching and finding best evidence.

AIM

The goal of the paper is to demonstrate the efficiency of sharing e-learning materials for training medical librarians and undergraduate medical students to acquire inevitable EBP knowledge and skills.

MATERIALS, METHODS

Two collaborative organizations in the Czech Republic, i.e. National Medical Library in Prague (NML-P) and Palacký University Medical Library in Olomouc (PUML-O) have been developing e-learning courses for health sciences librarians and undergraduate medical students, respectively. Besides text-based modules much effort was devoted to pre- and post-testing including formulation of the test questions.

Pre- and Post Test Questions	
1. Systematic reviews are important because	
a. They are based on an extensive literature search	
b. Combination of results of several primary studies can guarantee stronger evidential force	
c. They offer statistical data on disease epidemiology	
d. They contain critically appraised research results	
e. They contain only positive results	
2. What is the meaning of the PICO acronym?	
a. People Intervention Comparison Outcome	
b. Patient Injection Contrast Other	
c. Patient Intervention Compare Other	
d. Product Interview Compare Other	
e. Patient Intervention Comparison Outcome	
3. What is the greatest benefit of EBM for its users?	
a. Easily obtained information on the Internet	
b. Access to selected and critically appraised information	
c. Retrieval of free fulltext journal articles	
d. Access to statistical information	
4. Most of EBM studies deal with	
a. Risk	
b. Diagnosis	
c. Healthcare quality	
d. Prognosis	
e. Treatment	

Supplementary test questions (elective)	
1. You are working in a health sciences library. Your client needs current evidence on preventive measures for acute otitis media (AOM) in young children. Which of the items describes the research question best?	
a. Reduction of the number of AOM episodes	
b. Antibiotic treatment of the individual AOM episodes	
c. Children under 3 years of age with recurrent AOM	
d. Antibiotic prophylaxis in children with recurrent otitis media	
2. The EBM proces has at least 4 basic steps. Indicate their correct order.	
a. Using the results in clinical practice	
b. Searching for the best available evidence	
c. Critical appraisal of the retrieved evidence	
d. Transformation of the clinical problem to the answerable question	
d - b - c - a	
3. Evidence based medicine is using the pyramid of evidence. Arrange the research designs from the highest to the lowest level of evidence.	
a. Laboratory research	
b. Randomized controlled trial	
c. Case study	
d. Cohort study	
e. Expert opinion	
f. Systematic review	
f - b - d - c - e - a	

RESULTS

E-COURSE LIBRARY AND INFORMATION SERVICES IN HEALTHCARE

In 2012 National Medical Library in Prague (Czech R.) developed and organized an e-course for life-long education of medical and health sciences librarians using Moodle technology. The course was composed of 5 modules with module 4 solely oriented on EBP issues.

Educational method: e-learning, self-study, pre- and post-tests, feedback Scheme:

- Theme 1: Basic concepts of EBM
- Theme 2: Historical glimpses and personalities of EBM
- Theme 3: Four steps of EBM
- Theme 4: Clinical scenarios and PICO questions
- Theme 5: Role of systematic reviews and meta-analysis in evidence informed healthcare

Facilitators: medical librarians, information specialists

Pre- and Post Test Results

Question No.	Pre-test (n=35)			Post-test (n=32)		
	Correct answers (%)	Correct answers (number)	Incorrect answers (number)	Correct answers (%)	Correct answers (number)	Incorrect answers (number)
1	17%	6	29	50%	16	16
2	74%	26	9	87.5%	28	4
3	80%	28	7	93%	30	2
4	45%	16	19	75%	24	8

The results clearly show the course participants were excellent at understanding EBM benefits (Question No. 3) whilst their knowledge on systematic reviews was surprisingly rather poor in pre-test, but with substantial improvement in post-test (Question No. 1).

Supplementary Test Results

Question No.	Average value/maximum	Correct answers (number)
n = 16		
1	2.86/3.33	9
2	3.19/3.33	15
3	2.67/3.33	10

The best average score (3.19) was achieved for Question No. 2: 4 BASIC EBM STEPS. Lower average score (2.86) was recorded for Question No.1 : MATCHING KEYWORDS WITH CLINICAL SCENARIO. The worst average score (2.67) was related to knowledge on the HIERARCHY OF EVIDENCE (Question No. 3).

The course was attended by 35 librarians, and the completion rate was 91%, i.e. 32 participants.

The pre- and post test results have revealed that medical and health sciences librarians are able to perform competent information searches in the WWW, but they need further, systematic training to better understand the principles of biomedical research and its clinical outcomes.

CONCLUSIONS

The joint collaborative effort of health sciences and academic medical librarians have proven practical in developing online educational courses in EBP, in particular in terms of sharing teaching methods, e-learning materials and common online publishing solutions, eg. Czech medical education portal MEFANET.

It has become obvious that high-quality and fast library services represent an urgent challenge for both groups of the librarians to meet the increasing demands of healthcare professionals and academia. The librarians working in healthcare settings should know the information skills, competences and requirements of undergraduate medical students who are their future clients. Last but not least, the librarians must be brave enough to *Cross the Rubicon* of their own profession and become valuable partners of physicians, nurses, epidemiologists, biostatisticians and academic staff in the process of incorporating evidence based practice into everyday care.

UNDERGRADUATE EBM COURSE FOR MEDICAL STUDENTS

Palacký University Medical Library in Olomouc (Czech R.) adapted some of the existing EBP e-learning materials for medical librarians to develop an evidence based medicine elective, paediatric-focused course, using a blended learning approach. The main goal was to help undergraduate medical students understand basic principles and master inevitable skills of EBP so that future young physicians would be able to correctly implement both internal and external evidence in the process of clinical decision making in the environment of an „information society“ with all its technological and social aspects.

Educational methods: lectures, demos, online training, journal club, interactive wizard, e-learning

Full contact teaching: 14 hours/4 successive days

Day 1: Introduction to EBM, formulating a researchable question, PICO and FINER criteria

Day 2: Online information retrieval, searching multiple resources, hierarchy of evidence

Day 3: Evidence based paediatrics – local teaching practice and clinical experience

Day 4: Journal club – rapid critical appraisal of a meta-analysis

Facilitators: clinician-teacher, medical librarian, biostatistician.

E-learning: self-study modules are available from the educational portal MEFANET <http://mefanet.upol.cz>



In academic year 2012-2013 a total of 25 undergraduate medical students were enrolled and completed the course. Much attention was paid to critical appraisal of a medical journal article:

Rovers et al. Antibiotics for acute otitis media: a meta-analysis with individual patient data. *Lancet* 2006; 368(9545):1429-1435.

Purposefully, we selected an article rather difficult to read to show students the importance of being well-trained in critical appraisal skills. Journal club was a good tool to involve undergraduate medical students actively not only in analytical reading of a clinical article, but also to make them brush up their prior statistical knowledge and see it in a new, more practical light.

ABBREVIATIONS

EBM : Evidence Based Medicine
 EBP : Evidence Based Practice
 FINER : Feasibility–Interesting–Novel–Ethical–Relevant
 MEFANET : Medical Faculties Net
 NML-P : National Medical Library Prague
 PICO : Patient–Intervention–Comparison–Outcome
 PUML-O : Palacký University Medical Library Olomouc

ACKNOWLEDGEMENTS

The paper was supported by grant project CZ.1.07/2.2.00/28.0038 „MEFANET – clinical reasoning“. The authors thank Ms. Z. Michalikova for her excellent technical assistance.

REFERENCES

Aslam S, Emmanuel P. *Indian J Sex Transm Dis & AIDS* 2010;31(1):47-50.
 Gardois P et al. *Health Info Libr J.* 2011;28(4):273-284.
 Ubbink DT, Guyatt GH, Vermeulen H. *BMJ Open* 2013;3:e001881.
 Weberschock T. et al. *Evid Based Med.* 2012; 4 Aug. [Epub ahead of print].