



Teaching Evidence-Based Medicine to Undergraduate Medical Students: Information Specialists as Multi-Professional Team Members

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BACKGROUND

Evidence-based medicine (EBM) requires skills to find and critically appraise medical literature to get and apply the best evidence to clinical decision-making. In the past decades, many undergraduate medical curricula were criticized for not adequately preparing graduates to master the art of clinical and published evidence evaluation. There is an increasing trend worldwide to incorporate this sophisticated strategy into medical school curricula.

AIM

We are presenting preliminary results of the 2-year EU-supported project „*Introduction of EBM Principles to Graduate Medical Curricula*“ run by Palacky University Faculty of Medicine & Dentistry“ (Olomouc, Czech Republic). The project is managed by the steering committee consisting of medical teachers, a medical librarian, and an administrator. The main objectives of the project is to train undergraduate medical students in practical EBM skills to answer specific clinical questions in addition to background textbook information, and verify roles of information specialists in re-engineering of medical curricula.

METHODS

In the academic year 2006/2007, EBM concepts were being introduced selectively into preclinical and clinical courses of the general medicine curricula. Medical library staff was integrated in the direct EBM teaching in terms of literature searching, location of EBM knowledge in multiple resources and basics of critical appraisal of the literature. The librarians worked in a close cooperation with medical teachers to define information gaps in textbooks, in particular topics with clinical uncertainty, demonstrated online searching strategies across multiple resources and provided interactive group or one-on-one training.

RESULTS

Pilot Scheme I – „Information Retrieval Intermezzo“

Medical microbiology courses taught to 3rd year undergraduate students, traditionally presented via lectures using Powerpoint presentations, were adapted according to EBM principles. Medical teachers selected 2 topics with some clinical uncertainty and controversy to show that textbook data would not be always sufficient for up-to-date patient management.

Topic 1: Treatment of clostridial infection-caused gas gangrene with or without passive immunization?.

Topic 2: Is chemical prophylaxis against malaria efficient for travellers to endemic areas?

At the proper moment, the lecture was interrupted to give space to the librarian demonstrating online searches in 2 databases (PubMed, Micromedex) to show a wide selection of the current literature on the problem. The students were given handouts with the detailed description of the search strategy to support their active independent retrieval as part of self-study. The medical teacher then continued lecturing, added some comments on the results of the retrieval and emphasized the role of hierarchy of evidence in practical application of literature data.

Pilot Scheme II – „Patient-Oriented Evidence that Matters“

Until present, the core clerkship in pediatrics has been a 4-week teaching block for the 5th-year students (3 groups of 20) in the hospital setting. It was designed to introduce students to a wide range of clinical problems in pediatrics, including history taking, physical examination, diagnostic, and management skills. The pediatric curriculum has been modified to comply with the fundamental principles of EBM and includes now the following new components:

- *Introductory formal lecture*

It covers main EBM issues given by a medical teacher and a librarian. Students learn the role of asking well-built clinical questions, importance of information retrieval using multiple resources followed by thorough critical appraisal before implementation of the best evidence to an individual patient. For demonstration, we selected a hotly debated topic – *otitis media management* – to show the complexity of current research results documented in the literature dealing with pneumococcal vaccination to prevent recurrent otitis media.

- *Evidence-based assignment*

The students spend 4 weeks in the University Hospital Pediatric Department under guidance of their tutors. They are presented clinical cases; their main task is to elaborate an EBM case report. They are encouraged to pay individual visits to the library to get one-on-one training in search skills and/or perform critical appraisal of the literature with respect to their individual patient.

- *Group presentation of case reports* followed by discussion and final assessment.

DISCUSSION

Based on the recent studies¹⁻⁷ the role of highly qualified librarians and information specialists in the process of teaching evidence-based medicine is undoubted. In accordance with other findings⁶ our preliminary results have confirmed that medical librarians could act as equal members in a team of University teachers on the condition that they move beyond their routine library activities, in particular co-operate in selecting attractive clinical questions to perform sample searches; assist in finding research papers for teaching sessions; ensure that question formulation and finding quality evidence discussions are included in any teaching sessions; teach searching sessions to smaller groups and/or work one-on-one with students to offer extra searching help; are flexible in terms of dynamics of the group and different levels of students' searching experience. It has been proved practical to prepare illustrative and high quality handouts and other pre-course materials, both in printed or web-based format. The training is much more efficient if the students are well informed about the pre-requisites for the workshop. Many authors^{1,2,4,5} emphasized the significance of feedback and teaching skills evaluation. The results of our *Pilot Scheme I* were assessed by informal interviews, whilst *Pilot Scheme II* was subjected to standard teaching quality evaluation. The informal interviews with the students confirmed that the idea of "spicing" traditional microbiology lectures with demonstration of searching current literature online was very successful. The students thought that librarian tutors were integrated well into the coursework. A recent systematic review² that compared the effects of standalone and clinically integrated teaching in EBM found that knowledge improved with both teaching methods, but the results of our

evaluation of *Pilot Scheme II* clearly demonstrated students' preferences towards integrated teaching. Most of them declared that the pediatric clerkship was the first opportunity for them to feel like real doctors. Some students reported they needed more time for self-study than expected, that was actually the only criticism of the newly modified pediatric curriculum.

CONCLUSIONS

Our first attempt to incorporate EBM principles into undergraduate curricula seems to be a great success. The students trained in *Pilot Scheme I and II* were able to understand a necessity to search for current information to answer specific clinical questions in addition to background information found in textbooks. Informal interviews as well as formal teaching quality assessment showed that both types of new educational models of teaching EBM were enthusiastically received by participants of microbiology courses and pediatric clerkship. Other clinical departments have been working on introduction of EBM principles in a close cooperation with medical librarians.

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