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Letter to Editor

Evidence-based medicine education improve clinical knowledge of 4th year medical students in the university of medicine and pharmacy at Ho Chi Minh City

Vo Minh Tuan^{a*}, Bui Quoc Thang^{cd}, Truong Van Dat^b

^aFaculty of Medicine, University of Medical and Pharmacy at University Ho Chi Minh City, Vietnam;

^bFaculty of Pharmacy, University of Medical and Pharmacy at University Ho Chi Minh City, Vietnam;

^cDepartment of cardiovascular surgery, Cho Ray Hospital, Ho Chi Minh city, Vietnam;

^dDepartment of cardiovascular surgery, University of Tsukuba, Tsukuba, Japan.

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Abstract: Evidence based medicine (EBM) education is a modern method for medical students in clinical training based on the reasonable use of the best evidence in making decisions about individual patient's treatment. EBM education syllabus teaches medical student how to integrate the clinical experience and patient examination with the simplest out-there analysis data for increasing the utilization of top quality clinical analysis in clinical deciding, this methodology requires new literature looking out and proof evaluating skills. Thus, replacing the recently educated method by EBM has more challenges, the new program ought to analysis fastidiously for evaluating the behavior changes, the development of clinical skills and analysis the ultimate examination score for evaluating the effectiveness of EBM program. The result show that active teaching proves to be statistically completely different and has robust impact toward the ultimate outcome. EBM educated method might improve clinical knowledge and application of PBL/EBM brings concerning higher scores compared to recently educated method.

Keywords: Evidence-based Medicine; Problem-based Learning; Medical Education Conference 2017

Evidence-based Medicine (EBM) has been proposed as the most significant intellectual advance in the process of clinical decision-making through searching and using the best available research information [1, 2]. This approach requires integration of new skills of clinicians, including effective literature searching, application of formal rules of evidence in evaluating the clinical literature and proper, scientific judgment on each individual patient's health problem. The constant growth of medical knowledge, in particular the rapid development of clinical trials and observational studies, mandates that clinicians apply EBM in their practice [3]. However, it is clear that a large number of practicing clinicians fails to catch up with the explosion of EBM, probably due to lack of access or non-acceptance [4-11]. To address the gap, it is crucial that medical educators, preceptors, health policy makers integrate basic clinical epidemiology, probability and statistics, mega analysis

and medical information into undergraduate and graduate curricula.

The growing important role of EBM has been well proven, yet to train students with this skill set is a hard job. Many medical education programs incorporating medical information appraisal and clinical epi-demiology have been widely reported in the world [16-21]. The approach is largely employed in medicine residency journal clubs or fundamental reviews of literature [22-28]. The aim is to provide general clinical guidance highly available to health professionals. However, EBM teaching is often found to be disproportional with incomprehensive description of the method, the critical appraisal found insufficient leading to lack of effectiveness. Also, if too much attention is solely paid to basic knowledge on clinical epidemiology, or on critique skill or exploration of medical information from reference materials, then the journal clubs cannot equip medical students with EBM,

*Address correspondence to this author Vo Minh Tuan at the Faculty of Medicine, University of Medical and Pharmacy at University Ho Chi Minh City, Vietnam; email: vominhtuan@ump.edu.vn
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Table 1. The behavior changes: n=259 students, scale of 0-6

Assessment questions	Mean scores prior to intervention	Mean scores post intervention	P-value
1. Evidence-based literature reviews are critically important for the diagnosis of a patient's health problem?	4.98 (±0.99)	5.15 (±1.09)	0.002*
2. Information assessment as a skill should be further prioritized?	4.86 (±1.11)	5.00 (±1.14)	0.050*
3. Self-evaluation of the ability of "interpretation of findings from a study" and adopt of its implication to your patient.	3.39 (±1.61)	3.35 (±1.50)	0.817
4. Do you often search for answers from reference materials to a clinical question?	4.31 (±1.47)	4.31 (±1.44)	0.967
5. Do you pay attention to research methodologies when reading a medical journal?	3.32 (±1.92)	3.43 (±1.83)	0.424

*significant difference with $p < 0.05$ Wilcoxon signed-rank test

the method strictly requires clinical expertise and understanding of individual patient's clinical state, predicament, preferences before any clinical decision is made.

From middle 2007, due to the crowded medical students in hospital for clinical training and the short-age of lecturers, an initial attempt of incorporating EBM into case-based lectures in the Department of Obstetrics and Gynecology of University of Medicine and Pharmacy at Ho Chi Minh city (UMP) designed for 4th year students (Y4), who focus on symptomatology, diagnosis and monitoring with an extensive fund of clinical knowledge and high critical thinking capability. This pedagogical approach was called Problem Based Learning integrated EBM (PBL/EBM). PBL/EBM was based on the list of skills to be taught in replacement of part of lecture-based clinical theories, including self-identification of topics of importance, self-directed learning, problem-based learning, self-motivation, and access to various sources of information, professional feedback taking and giving.

Despite the fact that EBM has been employed in developed countries for decades, the approach PBL/EBM was first introduced to UMP, this causes challenges in terms of obtaining experiences and expertise from other faculties as well as reference materials available about how EBM affects to clinical knowledge, comparing with recently educated method. To address this question, we applied the new PBL/EBM curriculum of obstetrics and gynecology clinical training on 2009 for Y4 students and then evaluated the behavior changes, the development of clinical skills and analyzed the final examination score for evaluating the effectiveness of EBM.

Surprisingly, Y4 students were taught with more empathy on how to use evidence from clinical studies to solve the clinical problems they were encountering, the behavior changes (question 1 and 2) was a significant increase (table 1). But the development of skills in EBM application in PBL (questions 3,4 and 5) were not statistically significant. It could be possible that the described outcome was due to lack of basic science knowledge such as biostatistics and scientific research methods on the part of student, or resulted from the inconsistency of epidemiology program taught earlier. The weak foundation of basic science knowledge

made it difficult for students to build their skills upon because the criteria for a good skill set development include ability to formulate a focused, answerable clinical question when encountering a new clinical case, successfully searching relevant materials on PUBMED/MEDLINE, appraise the information presented in the clinical journals and applying evidence found from literature to the diagnosis of the clinical case of their concern. On the other hands, the three questions shared qualitative nature, thus, development of skills could be hard to measure. It demanded that quantitative survey be taken to assess adequately the skill development, for instance, case control and cohort survey.

Objective structured clinical examination (OSCE) was used as the standard method of assessment to evaluate the effectiveness of EBM. The results were statistically different between the two teaching methods. On a scale of 0-10 to each of 5 questions, the total PBL/EBM test score was 36.56; while the recently method test score was 32.55. The Y4 students in PBL/EBM curriculum may be increase their level of self-direction, thus demonstrated better understanding, longer retention and better critical thinking skills in managing clinical cases, appropriate behavior and attitude in learning brought them more motivation to gain higher score. However, the limit of question test bank may affect to the possible answers of the questions in 6 clinical cases which had been introduced to earlier batches of students (table 2).

Table 2. The examination clinical test score: n=259 students, scale of 0-50

	PBL/EBM	Recently method	P-value
OSCE	36.56 (±0.44)	32.55 (±0.42)	0.000*

* significant difference with $p < 0.05$

Nonparametric Wilcoxon signed-rank test

In summary, these result show that active teaching proves to be statistically different and has strong impact toward the final outcome of Y4 students' clinical theory test result and evidence-based medicine educated method may improve clinical knowledge of Y4 medical students in UMP, application of PBL/EBM brings about higher scores compared to traditional educated method. With regard to the result from the assessment of behavior and attitude toward the new teaching approach, Y4 students are excited and look

forward to expanding the PBL/EBM to all clinical disciplines. Thus, PBL/EBM active method should be standardized among all teaching units, collaborate with other medical schools to develop more PBL cases with higher quality and in more numbers, hold a pre-clinical session on how to analyze a scientific journal and introduce research designs, establish more control groups to assess effectiveness of this active teaching and learning method and school leadership reviews and supports implementation of PBL/EBM in all clinical disciplines.

METHOD

We conducted the outcome research study in Y4 students who underwent obstetrics and gynecology clinical training at the UMP on 2009 and exclude absent or not accepted participating. This type of study is designed for non-randomized, un-blinded interventions. The choice is based on its strength in assessing effectiveness of a method prior and after an intervention on the same group of subjects. We measured the effectiveness of EBM by measuring the clinical skills and behavior; we used the pre-test questionnaire on the first day of Y4 students' clinical training and the post-test on the last day of the 10-week clinical practice. For the measurement of learning performance, we employed objective structured clinical examination with a short circuit of 10 stations was set up with different clinical scenarios at each station. The students would be rated with the marking scheme from 0 to 10. The questions constructed for the first 5 stations had their focus on clinical theories using PBL/EBM method. The rest were built upon clinical theories guided in a traditional way. The Y4 students' mean scores from the two sets of stations would be used as a criterion for comparison outcomes of the two different teaching methods.

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