

Integrating evidence - based medicine in bedside teaching: a pilot study

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Abstract

Background: EBM has undergone a revolution over the last 10 years. Teaching at the bedside is of thought to be applicable to any situation where the teaching occurs in the presence of the patients. This study aims to explore the undergraduate students' attitudes towards EBM (evidence-based medicine) before and after the EBM integrated bedside teaching.

Methods: This is a before-after comparison study. Twenty four 5th year medical students rotated in paediatric department, Khon Kaen Hospital during November-December 2006 were recruited. EBM integrated bedside teaching was conducted in 4 sessions. Principles of EBM practice were taught and students were asked to immediately apply them to patients' problems. Their attitudes towards EBM were assessed using a semi-structured questionnaire and a focus group discussion.

Results: The medical students tended to search for information via generic search engines and were more specific after teaching. Critical appraisal was their weakest skill. The concept of EBM was clearer to them after teaching. They also reported that the EBM practice is needed and important for doctors, and that they required more training.

Discussion: The knowledge and skills needed for critical appraisal and EBM have not been covered in undergraduate until recently. These education needs are often met through postgraduate journal clubs and workshops which might not be appropriate to undergraduate learning. EBM integrated bedside teaching might be an alternative.

Background

Evidence-based medicine (EBM) has undergone major developments over the last decade. The science to synthesize research has also grown insidiously. The Cochrane Collaboration and others are preparing reliable summaries of research about the effects of care, while policy makers and clinicians are drawing on these reliable reviews in decision making and delivery of care.

Barriers to an EBM practice are well identified in the literature and significantly impact the use of research evidences in practice. The domination of the authoritative-based and intuition-based medicine debate which is the consequence

of traditional approaches to medical education may be one of the considerable barriers to the dissemination of EBM. Moreover, the practice environment that supports and promotes the use of best evidence requires clinical practice policies and procedures to be evidence-based (Oman et al., 2008; Khoja & al Ansary, 2007).

The knowledge and skills needed for critical appraisal of literature and evidence-based practice have not been covered in undergraduate curricular until recently (Azarpazhooh et al., 2008). These educational needs are therefore often met through postgraduate journal clubs and workshops. Several reviews have assessed the effectiveness of such educational measures (Coomarasamy & Khan, 2004; Norman & Shannon 1998). However, such a technique of knowledge delivery that is commonly practiced in mature students may not be suitable for

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the undergraduate student (Azarpazhooh et al., 2008).

Teaching at the bedside is thought to be applicable to any situation where the teaching occurs in the presence of the patient (Jenkins et al., 2007; Yusuf, 2005). Moreover, this method of teaching has a potential to improve EBM practice and subsequently, the quality of care for patients. This study, thus aims to explore the understanding and attitudes of undergraduate students towards the EBM integrated bedside teaching.

Material and Methods

Study design

This is a before-after comparison pilot study to explore the attitudes of undergraduate medical students towards EBM before and after EBM integrated bedside teaching.

Participants

Twenty four of 5th year medical students rotated in Paediatric department, Khon Kaen Hospital during November-December 2006 were recruited.

Procedure

The selected students were allocated equally into 4 groups. EBM integrated bedside teaching was conducted in 4 sessions which lasted approximately 1-1.5 hours for each. The principles of practice of EBM were taught and asked the students were requested to put them to practice at each session.

Intervention

At each session, one of four principles of EBM practice was taught, the concept of each principle being introduced didactically at the beginning of the session. Students were then encouraged to do group practice immediately afterward. All of the steps were performed regarding patients' problems that arose during the bedside teaching in each session. The four steps (principles) of EBM included:

- (i) Formulate an answerable question
- (ii) Track down the best evidence
- (iii) Critically appraise the evidence
- (iv) Integrate with clinical expertise and patient values

Main outcome measures and questionnaire administered

Newly developed and piloted semi-structured questionnaires were distributed and students were asked to fill in the questionnaire before and then after the conclusion of 4 sessions.

The questionnaire covered the following areas

1. Resources where student used to access EBM
2. Confidence of using accessed information
3. Attitudes of EBM integrated bedside teaching including satisfaction
4. Conflicts arisen from EBM practicing
5. Idea about EBM integrated bedside teaching

Moreover, a group of 6 medical students who reported that EBM was not necessary to medical students were asked to enroll in the focus group discussion to confer their attitude about practicing EBM. A time and venue comfortable to the students was arranged. Broad questions about EBM practice were initially discussed. Students were encouraged to talk openly and informally along with appropriate probes to encourage participant elaboration and clarification. Projective questioning procedures will be used to tap emotional responses. All the discussions were taped recorded and then transcribed. A brief presentation was fed back to the group for verification of data given by them.

The group discussion lasted approximately 1 hour, and all were moderated by an investigator. The students were encouraged to have a genuine discussion, talking between themselves rather than addressing all their remarks to the moderator. However, steps were taken to create an atmosphere of mutual trust and respect. This ensured that individuals stayed within the whole-group discussion, that the moderator can intervene to probe and move the discussion on when necessary, and that interruptions and instances of more than one person talking at a time were kept to a minimum.

Piloting of the questionnaire

The pilot study was conducted with up to 20 interns to check for the completeness of the questionnaire. This took approximately

2 weeks to complete. Problems related to wording of the questions, frame of reference, description in the questionnaire that occurred during the pilot study were recorded. The questionnaires were, then, revised. After piloting, the final version of questionnaire was produced.

Data analysis

Quantitative analysis

All participants were assessed on their attitudes and understanding of EBM just prior to the first session using the semi-structured questionnaire. At the end of the fourth session their attitudes and understanding of EBM were re-assessed. SPSS (Version 15.0) software programme was used for statistical analysis. Frequency tables will be presented together with percentages while mean values and standard deviations will be shown if appropriate. Parameters will be tested uni-variately for difference between pre- and post-test group. Parameters were classified and then tested if applicable. Comparison of the two groups was performed using Pearson's chi-square Test. P values < 0.05 were considered significant.

Qualitative analysis

The focus group discussion was audio taped for later transcription with the permission from the students. The content was analysed to identify trends and patterns that reappear within the focus group. Data were coded independently by 2 research assistants to increase the reliability of the study.

The transcripts formed the 'raw data' for analysis, along with notes made by researcher during and immediately after the discussions. Transcripts were analyzed using a thematic indexing and charting system – a form of qualitative coding and thematic sorting often known as 'Framework'. This method involved creating an index or code frame of substantive themes and charting key findings within each theme, systematically coding up transcripts for key points and illustrative verbatim comments. Findings on the key themes for each group were then summarized on a chart incorporating the key verbatim.

The charting method was used to ensure analysis of the data was rigorous,

balanced and accurate, allowing the themes and hypotheses developed initially to be refined after a review of the evidence. The researcher was very careful at all stages to look for quotes to support both sides of any given argument, rather than only those statements which appeared to support initial hypotheses. The discussions were written up to provide a detailed and accurate overview of the key themes and findings. Quotes from individuals have been chosen to illustrate the range of viewpoints on each theme.

Ethical approval

This study has been approved by the Ethics Committee for Research in Humans, Khon Kaen Hospital.

Results

There were 24 fifth year medical students in this study; 11 were male and 13 were female. Their ages were similar across the group with an average of 23 years, and their mean grade point average (GPA) was 3.21 (maximum=4). At the time of delivery of the EBM integrated bedside teaching during November to December 2006, they were in the second half of the academic year 2006.

In relation to sources of medical knowledge for medical student, the first 3 frequently used by the students were standard textbooks, internet and consultation with senior doctors or medical staff (see Table 1) both before and after teaching EBM. However, what we have observed was that they tended to search via generic search engine such as google or yahoo search before teaching and more specific to medical searching such as using pubmed after teaching.

Most of them have reported that they have heard about EBM since they were in the fourth year, but not quite clear about the meaning and method of performing EBM practice. Thus, at the time before teaching EBM integrated bedside teaching, they were not confidence about EBM practice. However, after the 4 sessions of teaching, the concept of EBM was clearer, and need more opportunities to practice to gain their confidence. After teaching, most of them stated that critical appraisal was their weakest skill followed by searching skill.

Table 1: Sources of medical knowledge reported by the medical students

<i>Sources of medical knowledge</i>	<i>Before teaching (n=24)</i>	<i>After teaching (n=24)</i>
<i>Most frequently used: N</i>		
<i>Standard Textbook</i>	10	10
<i>Internet searching</i>	8	10
<i>Consultation with senior staff</i>	6	4
<i>Most updated: N</i>		
<i>Standard Textbook</i>	6	6
<i>Internet searching</i>	10	14
<i>Consultation with senior staff</i>	8	4
<i>Most reliable: N</i>		
<i>Standard Textbook</i>	12	12
<i>Internet searching</i>	8	4
<i>Consultation with senior staff</i>	4	8
<i>Most convenient: N</i>		
<i>Standard Textbook</i>	10	9
<i>Internet searching</i>	6	8
<i>Consultation with senior staff</i>	8	7
<i>Most suitable for daily access: N</i>		
<i>Standard Textbook</i>	12	10
<i>Internet searching</i>	8	5
<i>Consultation with senior staff</i>	4	9

The students informed that EBM practice was important and required to be integrated into the curricular. However, six of them stated that EBM was unnecessary for the medical student. During the period of teaching, some of them reported of having conflicted between the real practice they had observed in wards and what they found in updated literatures which required more clarification for them.

For those who said that EBM was unnecessary for medical students, they

were asked to join the focus group for the discussion.

After the exploration of their attitudes, some limitations for the medical students about practicing EBM were raised. This included limitation of time, resources and required skill (e.g. appraisal and searching skills). Some of their comments are listed verbatim in Box 1. Students found EBM integrated bedside teaching, relatively pragmatic as it has shown the practical approach to patients' problems using EBM.

Box 1: Verbatim from the medical student about EBM

“I know that it (EBM) is important, but we (medical students) don't have time, what I can do right now is just to manage to survive day by day”

“I think textbooks are already enough for us (medical students)”

“I think it (EBM) is too difficult, I don't know how to critique, how to do searching. If I do it wrong, then I will waste my time”

“I think the idea (about EBM) is good, but I don't think we (medical students) can do it everyday”

“I will be better to have someone to conclude everything for us, but I don't think we can have one”

Discussion and conclusion

The objective of this pilot study was to demonstrate the attitudes of medical students towards EBM. It has also shown that it is possible to teach EBM at the bedside during ward rounds. From this study, we can observe the change in the way they search medical literatures. In relation to practice EBM, the students were still not confident about appraising and searching for evidence, and this suggested the need for more training.

Aside from the above, this study also identified the possibility to deliver the concept of EBM to undergraduate students by encouraging them to use all relevant medical knowledge resources to answer patients' problems. However, with time limitation of teaching, the sustainability of EBM practice in this group of students was still questionable. Moreover, despite the short duration of teaching, conflicts between updated literature and real practice can be observed by the students and this might cause confusion for them, as we know that traditional approaches to medical education may be one of the considerable barriers to the dissemination of EBM (Yousefi-Nooraie et al., 2007).

Appraising and searching skills were the students' weakest skill, this has the same opinion with some experts who suggested that introductory EBM courses should be simple and certain topics such as critical appraisal and statistical methods should

be left to advanced courses (Yousefi-Nooraie et al., 2007b). This is confirmed by another study where most clinicians stated that EBM was important for clinical practice. However, biostatistics was still found to be challenging (West & Ficalora, 2007).

From the student verbatim, their workload was considered as the main obstacles to practice EBM which also agree with one study which have stated that workload and resources such as library were needed to achieve EBM practice². Another issue to bear in mind is that each clinical problem is different, and the resources available to solve each problem can be varied. Student must search for the best evidence but understand that in some circumstances there may be no good evidence to support clinical judgment (Collins, 2007).

In conclusion, EBM integrated bedside teaching may be an alternative to journal clubs or workshops for teaching EBM to undergraduate medical students. However, regular course throughout the clinical years and supervision from skilled staff are also required. The process of EBM practice should also be promoted iteratively.

Acknowledgement

The author thanks the Medical Education Center and medical staff at the Department of Paediatrics, Khon Kaen Hospital for their dedication to patient care and education. The author also

acknowledges the Research Committee of the Khon Kaen Hospital for its support and encouragement.

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