COMPUTER-ASSISTED INSTRUCTION IN EVIDENCE-BASED MEDICINE: A PILOT STUDY

OUTLINE

- BACKGROUND & AIM
- COMPUTER-BASED EBM CURRICULUM
- METHODOLOGY OF SYSTEM EVALUATION
- RESULTS
- CONCLUSIONS

BACKGROUND & AIM

- **Evidence-based medicine**: Guyatt & all in 1991
  - imposes the translation of knowledge resulted from research in daily individual decisions

- **Aim**:
  - Self-directed learning
  - Evidence-based medicine training
  - Undergraduate students: Faculty of Medicine
  - Computer-based curriculum: assesment of effectiveness

COMPUTER-BASED EBM CURRICULUM

- **Goals:**
  - Promoting the access to EBM knowledge and resources for the Romanian medical students
  - Increasing students' awareness and use of relevant medical evidence
  - Teaching the calculation and interpretation of fundamental EBM metrics

COMPUTER-BASED EBM CURRICULUM

- **Incorporates thirteen modules and six resources:**
  - Assisting creation and browsing of critical appraised topics - CATRom
  - Assisting creation and browsing of guidelines models and clinical practice guidelines - Guidelines
  - Calculation of 95% confidence interval for proportions
  - Twenty diagnostic and treatment guidelines published by the Romanian College of Physicians
  - Seventeen materials on proved based medicine published by Stetoscop Journal
  - EBM dictionary

COMPUTER-BASED EBM CURRICULUM

- **Knowledge evaluation:**
  - Interactive system
    - End of each module: five multiple-choice questions with one to up to four correct answers: ***self-evaluation***
    - End of couse evaluation: fourty-five multiple-choice questions with one to up to four correct answers: ***teacher-asssited evaluation***

METHODOLOGY OF SYSTEM EVALUATION

- 4th year undergraduate medical students
- Faculty of Medicine
- "Iuliu Hatieganu" University of Medicine and Pharmacy Cluj-Napoca, Romania
- Academic year 2005-2006
- One series out of five

METHODOLOGY OF SYSTEM EVALUATION

- The aim of the study & enrolment
- Students eligiblility:
  - Attended to the traditional course for EBM education
  - Complete the baseline characteristics form (access to an individual computer with CD-ROM)
  - Complete the consent participation form

METHODOLOGY OF SYSTEM EVALUATION

- Two groups: intervention and control
- Both:
  - Traditional EBM two-hour course (covered the steps of practicing evidence-based medicine):
    - 18 true/false paper-based questionnaire with 5 problem-based questions
  - Previously received training in research methodology, epidemiology, and statistics
- Intervention group: additional computer-based training (3 months)
  - 45 multiple-choice questions with 15 clinical problem-based questions

RESULTS: SUMMARY OF GROUPS CHARACTERISTICS

- Differences between the groups:
  - Gender
    - 67.50% F in intervention group – n = 40
    - 64.29% F in control group – n = 56
    - p = 0.743
  - Age:
    - m_i = 21.78 in intervention group
    - m_c = 21.91 in control group
    - p = 0.235

RESULTS: SUMMARY OF GROUPS CHARACTERISTICS

- Differences between the groups :
  - Computer access:
    - p = 0.713
  - Internet access:
    - p = 0.676
  - 1st time contact with EBM:
    - p = 0.003 (A higer percent of students from intervention group were familiar with the EBM previous to the study compared with the control group)

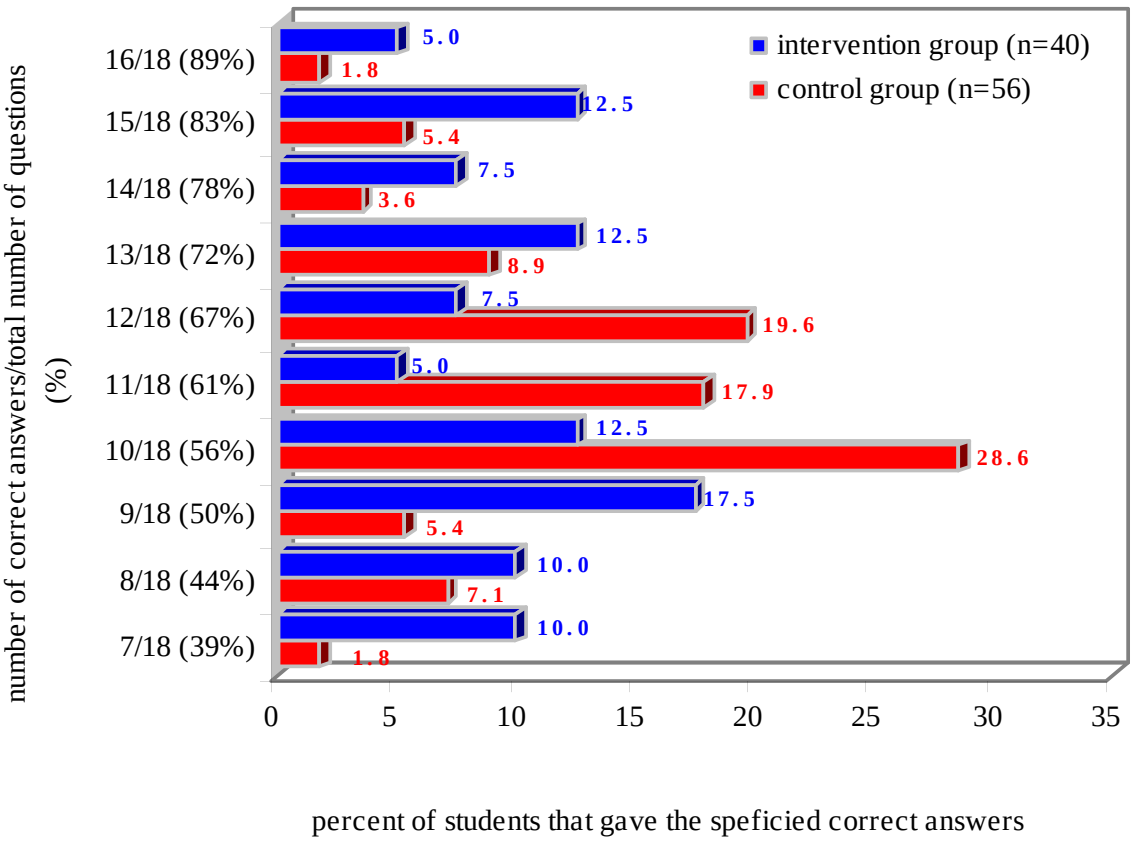
RESULTS: EVALUATION OF WEB-BASED CURRICULUM

Characteristic	*Group*	
	Intervention (n = 40)	*Control (n = 56) & Intervention (n = 40)*
No. questions	45	18
(type)	(MCQs with five options)	(True/False statement)
Average	37.90	11.11
[95%CI]	[37.21–75.11]	[10.64–11.58]
StDev	2.15	2.32
Me	38	11
Min	32	7
Max	42	16

MCQs = multiple-choice questions; StDev = standard deviation; Me = median; Min = minimum; Max = maximum; 95% CI = 95% confidence intervals.

RESULTS: EVALUATION OF WEB-BASED CURRICULUM

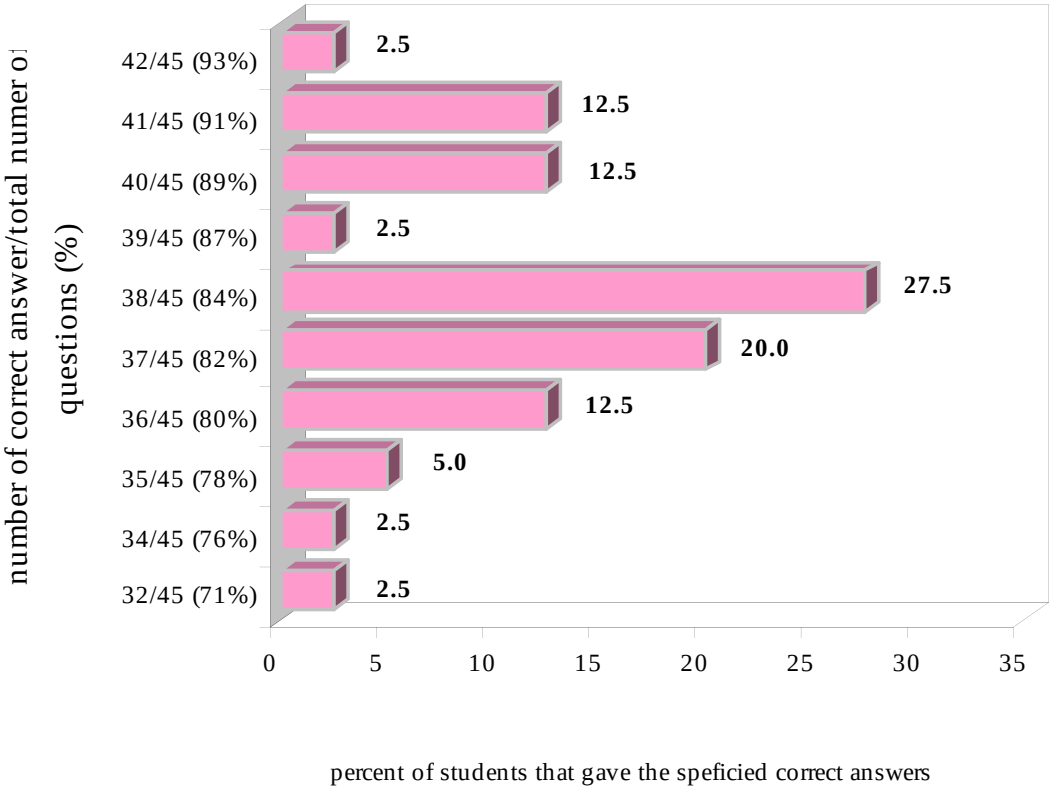
- Students' performances (both groups): eighteen questions test



RESULTS: EVALUATION OF WEB-BASED CURRICULUM

- At the end of EBM course:
  - There were not significant differences on EBM knowledge between intervention and control groups:
    - $p = 0.7948$
    - $n_{intervention} = 40$
    - $n_{control} = 56$

RESULTS: EVALUATION OF WEB-BASED CURRICULUM



- Students' performances on intervention group: test of forty-five questions

RESULTS: EVALUATION OF WEB-BASED CURRICULUM

- **Comparison intervention and control groups:**
  - Averages of the proportion of correct answers:
    - intervention group: 0.844, n = 40
    - control group: 0.617, n = 56
    - p = 0.0174

RESULTS: EVALUATION OF WEB-BASED CURRICULUM

- **Comparison intervention and control groups:**

Class	*1: ≥ 50*	*2: ≥ 60*	*3: ≥ 70*	*4: ≥ 80*
$f_{a\text{-}int}$	40	40	40	36
$f_{r\text{-}int}$	1	1	1	0.9
95% $CI_{fr\text{-}int}$	[0.90–1.00]	[0.90–1.00]	[0.90–1.00]	[0.78–0.97]
$f_{a\text{-}con}$	51	32	11	6
$f_{r\text{-}con}$	0.9	0.6	0.2	0.1
95% $CI_{fr\text{-}con}$	[0.80–0.96]	[0.43–0.70]	[0.11–0.32]	[0.04–0.21]
p	0.0421	< 0.001	< 0.001	< 0.001

f_a = absolute frequency; f_r = relative frequency;
95% CI_f = 95% confidence interval for relative frequency;
int = intervention group (n = 40); con = control group (n = 56)

CONCLUDING REMARKS

- Traditional method for EBM training (a two-hour course) it is not adequate
- The interactive web-based approach was efficient and effective in undergraduate students' EBM education
- However, more researches comparing the proposed web-based curriculum with other educational models, applied on residents and practitioners are imperative

References

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Thank you for your attention!