Evaluating the Effectiveness of Evidence Based Health Care: Where is the Evidence?

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Background

- **Effectiveness of EBHC training in terms of:**
  - Learner outcomes
  - Patient outcomes
  - Health system outcomes
- **Need for credible evidence essential for guiding, assessing & funding interventions**

Aims

- To provide an overview of the existing evaluation research
- Identify limitations & knowledge gaps
- Lay down the path for structuring a framework for evaluation of EBHC training

Methods

- ***Question:***

  How do we know that EBHC training makes a difference?

- ***Search:***

  MEDLINE *(1980-August 2005)*

  EMBASE *(1980-August 2005)*

  CINAHL *(1982-August 2005)*

  COCHRANE

Methods

- **Search:**
  - "evidence-based medicine" OR "evidence-based health care" [MESH]

    AND
  - "education" OR "teaching" [keywords]
  - No language restrictions

- **Studies of interest:**
  - P: Any health care learner
  - I: Any method of EBHC training
  - O: Any effect on leaner, patient or health system

Methods

- **Literature grouped by:**

1. **Outcomes:**
   - **A. Learner outcomes:**
     a. Affective satisfaction
     b. Attitude change
     c. Improved knowledge, skills
     d. Changed behavior
   - **B. Patient outcomes:**
     a. Improved patient satisfaction
     b. Health-related QOL
     c. Improved health
   - **C. System outcomes:**
     a. Reduced cost/better care for a similar cost
     b. Population-level clinical indicators of health/well-being
2. **Study design:**
   SR, RCT, Before-after, other

Results

Retrieved
N= 1168

Reviewed
N= 31

Selected
N= 12

6 SR's:
Knowledge/skills

2 RCT's:
1 Attitude
1 Behavior

4 Before-after:
2 Knowledge/skills
1 Decision-making
1 Patient outcome

SYSTEMATIC REVIEWS						
Author (Date)	**Study Design (No.)**	**Learner**	**Intervention**	**Outcome**	**Validity**	**Conclusion**
Norman & Shannon (1998)	CT (4) RCT (3)	Medical students; residents	Critical appraisal skills	Knowledge; decision making	Methodological score: 50-83% Small sample sizes	Undergraduate: Improved knowledge*; Small effect sizes Postgraduate: Minimal change in knowledge; No change in decision making
Taylor, et al. (2000)	CT (10) Poor quality	Medical students; Residents	Critical appraisal skills	Perceived confidence in ability to critically appraise; Evidence-seeking behavior; Knowledge	Median Quality score 3/10	Improved knowledge; Inconclusive results for other outcomes
Parkes, et al. (2001)	RCT (1)	Health professionals	Critical appraisal skills	Knowledge; Process of care; patient outcomes	Small sample size	Modest improvement in knowledge*; No evidence found for other outcomes
Coomarasamy, et al. (2003)	RCT's (4) Controlled, non-randomized (6) Before-after (9)	Postgraduates	EBM; critical appraisal	Knowledge; Skills; Attitude; Behavior	Heterogeneous study features & methodological quality	Improved knowledge*; No comment on effect sizes No change in other outcomes
Brettle (2003)	RCT's, Cohort, qualitative (24)	Health care professions	Information skills	Skills; Patient care	Marked heterogeneity of study designs	Limited evidence on improved skills or change in patient care
Coomarasamy & Khan (2004)	RCT's (4) Controlled non-randomized (7) Before-after (12)	Postgraduates	Stand-alone EBM teaching vs Clinically integrated EBM teaching	Knowledge; Skills; Attitude; Behavior	Heterogeneous study features & methodological quality	Stand-alone: improved knowledge only. Clinically-integrated: improved knowledge, skills, attitude & behavior; No comment on effect sizes

BEFORE-AFTER STUDIES						
Author (Year)	**Study Design**	**Learner**	**Intervention**	**Outcome**	**Validity**	**Conclusion**
Akl, et al. (2004)	Controlled (2 groups); Validated instrument (Berlin)	Postgrad.	Elective rotation in EBM	Knowledge	Adequate randomization; Control blinded; Validated instrument	Improved knowledge (NS)
Webersc hock, et al. (2005)	Uncontrolled Validated instrument	Medical students	4 EBM seminars; Peer- teaching	Knowledg e & skills	Self-assessed outcome	Improved knowledge & skills**

Outcome: Knowledge & Skills

- **SR's (6):**
  - ***Study design:*** **Heterogeneous**
    - **CT vs RCT, qualitative, before-after**
  - ***Quality:*** **Variable**
    - **limited vs comprehensive search**
  - ***Learner:*** **Heterogeneous**
    - **Undergrad. vs postgrad.**
    - **Medical vs other health care professin.**

Outcome: Knowledge & Skills

- **SR's (6):**
  - ***Interventions:***
    - **Teacher: peer vs tutor**
    - **Delivery mode: lectures vs PBL; stand-alone vs clinically-integrated**
    - **Duration: No. seminars, No. hours etc..**
    - **Supporting tools: e-databases, CATs..**
  - ***Outcomes:***
    - **Variable definitions**
    - **Change in KSA vs individual effect size**

Outcome: Knowledge & Skills

- ***Validity:***
  - **Heterogeneous study designs; methodologically weak**
  - **Bias:**
    - **Control group; contamination?**
    - **Baseline characteristics**
    - **Small sample size**
  - **Assessment tools: Heterogeneous**
    - **Validation & process**
    - **Ability to capture all effect**
    - **Sustainability of effect**

Outcome: Knowledge & Skills

- ***Conclusions:***
  - Modest short-term improvement, mainly in undergraduates
  - Postgraduates: improvement limited to clinically-integrated teaching
  - ?? Spurious conclusion (previous limitations)
  - Sustainability of effect ??
  - Link to decision-making & patient outcome ??

Effectiveness of EBHC training on behavior, attitude, decision-making and patient outcomes.

AUTHOR (YEAR)	STUDY DESIGN	LEARNER	INTERVENTION	OUTCOME	VALIDITY	STUDY CONCLUSION
Forsetlund, et al. (2003)	RCT	Norewgian physicians	EBHC workshop; Newsletter; Information service; Electronic database; Electronic discussion list	Behavior; Use of EB-research	Adequate randomization & blinding; validated instruments; adjusted analyses; <80% response; No ITT analyses	No change in behavior; Increase in knowledge*
Stevenson, et al. (2004)	Cluster RCT	Physiotherapists	EB programme	Attitude	Small sample size; blinding?; self-administered validated instrument	No change in attitude
Straus, et al. (2005)	Before-after; No control	Attending physicians & residents	7 one-hour sessions on EBM skills; Electronic evidence-based resources	Decision-making	Blinding of outcome assessors; Objective outcome assessment	Increase in high-quality EB interventions*
Jeffery, et al. (2004)	Before-after; No control	Macedonian doctors & nurses	EBM education; Infrastructural & organizational support	Perinatal mortality rate (PMR)	Objective outcome assessment	PMR reduced by 21.5% in 2 years** (EBM education contribution?)

Outcome: Behavior

Forsetland, et al. (2003)

- **RCT, Norwegian physicians**
- **Interventions:** EBHC workshop; Newsletter; Information service; Electronic database; Electronic discussion list
- **Outcome:** Behavior change; Use of EB-research in written reports
- **Result:** No change in behavior
  - <80% response; No ITT analysis

Outcome: Attitude

Stevenson, et al. (2004)

- **Cluster RCT, Physiotherapists**
- **Interventions:** EB prgramme; Opinion leaders taking part in training sessions
- **Outcome:** Attitude toward EBP; self-administered questionnaire (face & content validity)
- **Result:** No change in attitude
  - Baseline differences; underpowered

Outcome: Behavior & Decision-making

Straus, et al. (2005):

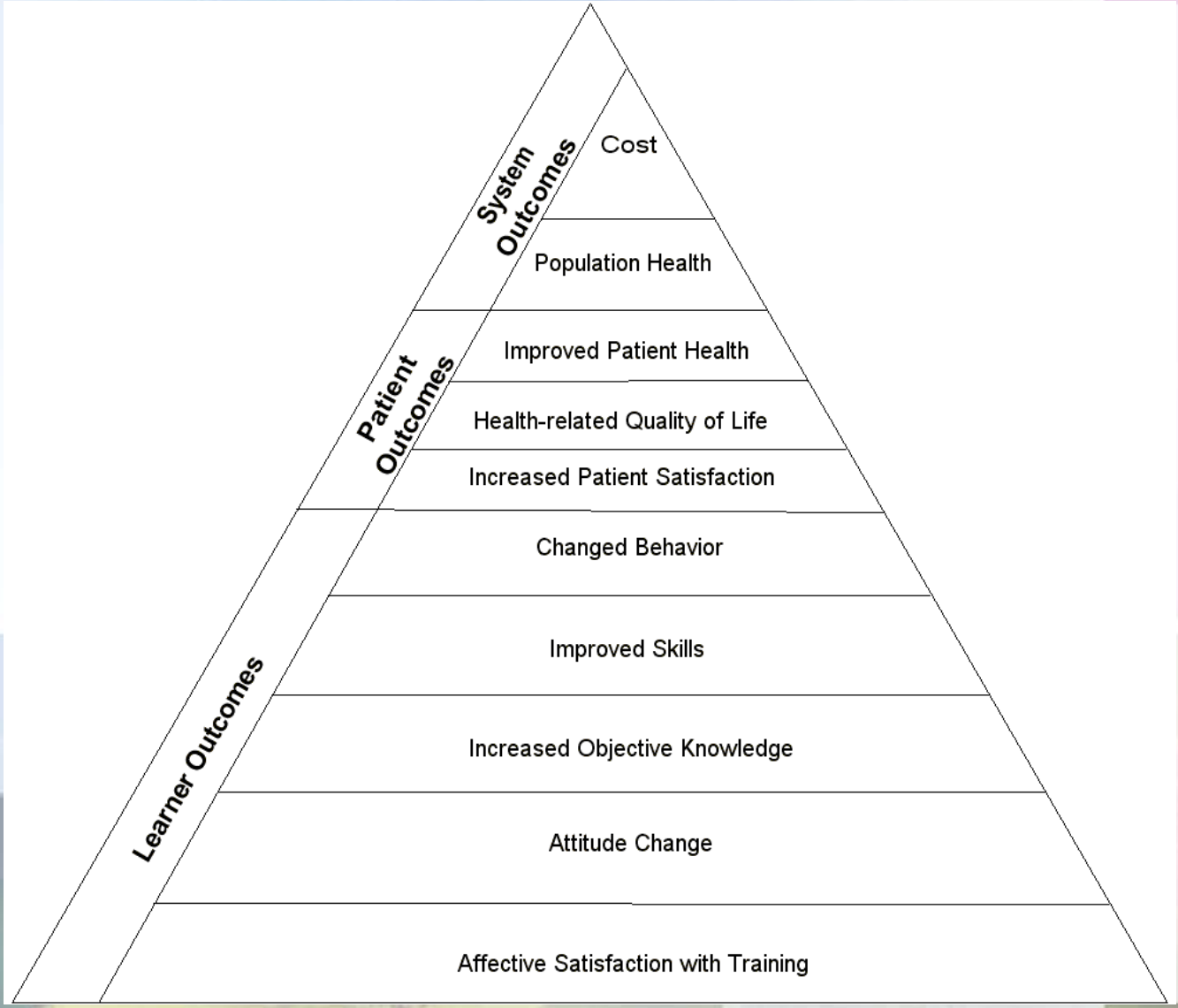
- **Before-after: single-group attending physicians & residents**
- **Interventions: 7 EB sessions; e-EB resources on hospital network & ward**
- **Outcome: Provision of EB Rx to patients; pre-post review of charts**
- **Result: ↑ high-quality Rx****
  - **Common diagnoses (relevance)**
  - **Independent blinded data extraction**

Patient Outcome; Clinical Indicator

Jeffery,et al. (2004):

- **Before-after: All Macedonian doctors & nurses**
- **Intervention: EB education + infrastructural & organizational support**
- **Outcomes: Learner (satisfaction, competence, problem solving); Health system (perinatal mortality rate)**
- **Result: ↓PMR** (21.5% in 2 yrs)**
  - **Formative & summative evaluation**
  - **Measures matched aims**
  - **Sustainability?**

Recommendations



Recommendations

- **Evaluation: Educ. Interventions➔ teaching & learning pathway**
- **“Big picture”: Knowledge, skills, practice & patient outcome**
- **Complex designs: qualitative & quantitative; RCT vs controlled before-after; multi-site (cluster?)**
- **Measurement tools capturing all domains**
- **Sustainability over time**
- **Health care systems: contextual evaluation**


Thank you