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Educational Outcomes
No Financial Disclosures
Medical Education a rapidly growing field of research
Call for accountability and return on investment
Evaluate connection between medical education and outcome

Quality of patient care determined to some extent by quality of medical education that students and residents receive

Little funding medical education research

Challenges

- Insufficient resources, funding, training, experience
- Difficulty navigating institutional review boards
- Small sample sizes
- Difficulty defining outcomes that are relevant and measurable

Review of outcomes in medical education

- Trainee assessment and satisfaction most frequently studied
- Trainees (69%) > Faculty (19%) > Providers (8%) > Patients (4%)
- Performance (49%) > Satisfaction (34%) > Cost (2%) > Patient outcomes (0.7%)

Necessary Elements

- These include theoretical frameworks, the application of rigorous study design and the use of meaningful outcomes.

Steps to Educational Research

- Identify research problem or question
- Conceptual framework to guide study
- Craft research question
- Design study
- Define outcome

Whose perspective?
- Trainee
- Faculty/educator
- Patient
- Provider/health care system

What are we measuring?
- Performance
- Satisfaction
- Professionalism
- Quality of life
- Cost

Trainee Outcomes

- **Performance**
  - Exam scores
  - Reporting
  - On call

- **Satisfaction**
  - Opinions, feelings, beliefs and attitudes

- **Professional issues**
  - Ethical, moral and career choices

- **Cost**
  - Financial outcomes or implications

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Faculty Outcomes

- Performance
  - Noon conference
  - At the view box
  - Clinical/procedural
  - Assessment/feedback

- Satisfaction
  - Opinions, feelings, beliefs and attitudes

- Professional issues
  - Promotion, tenure, career choice

- Cost
  - Financial outcomes or implications

Patient Outcomes

- **Clinical**
  - Morbidity, mortality, length of stay
- **Satisfaction**
  - Perceptions regarding health care
- **Quality of Life**
  - Abilities to care for themselves, activities of daily living
- **Cost**
  - Financial outcomes or implications

Provider / Health Care System Outcomes

- Performance
  - Practice patterns
  - Quality metrics
- Satisfaction
  - Opinions, feelings, beliefs and attitudes
- Professional issues
  - Ethics, morality, career choice, quality of care
- Cost
  - Financial outcomes or implications

**Conceptual Framework**

- Way of thinking about research question or study
- Representing how complex systems work
- Framework used to guide study will determine which research aspects to focus on
- **Well designed studies will pose research question in the context of conceptual framework being used**

Educational Theories and Models

- Behaviorism
  - Classical conditioning
  - Operant conditioning
  - Goals operators methods model
  - Social learning theory
- Cognitivist
  - Assimilation
  - Attribution
  - Cognitive load
  - Component display
  - Elaboration
  - Gestalt
  - Mental models
  - Schema theory
  - Stage theory cognitive development [Piaget]

Educational Theories and Models

- **Constructivism**
  - Case based
  - Cognitive apprenticeship
  - Communities of practice
  - Discovery
  - Goal based scenarios
  - Social development theory
  - Problem based
  - Situational learning

- **Humanism**
  - ARCS model of motivational design
  - Experiential learning
  - Facilitative teaching
  - Invitational learning Perkey
  - Maslow hierarchy of needs

- **Design based**
  - Elaboration theory
  - ADDIE Model of instructional design
  - ARCS model of motivational design

Evidence Based Guidelines

- Systematic reviews of teaching methods
  - Best Evidence Medical Education Guides
- Evidence based educational practice guidelines

Craft the Research Question

- F-Feasible – enough subjects, technical expertise, affordable
- I-Interesting to investigator and audience
- N- Novel – confirm or refute prior findings, or provide new findings
- E-Ethical
- R-Relevant to science, policy, future directions

Study Design

- Curricular innovations
  - E.g. Kern six step process
- Consensus conference proceedings
  - identifying and addressing knowledge gaps
- Qualitative research studies
- Quantitative research studies
- Mixed methods research studies

Curricular Innovations

- Problem / general need identification
- Target needs assessment of learners
- Educational goals and objectives
- Instructional strategies
- Implementation
- Evaluation and feedback

Outcomes Curricular Innovations

- **Subjective**
  - Learner satisfaction (Likert)
  - Self reported confidence (Likert)

- **Objective**
  - Knowledge (numerical, yes/no)
  - Skills (procedural, reporting)
  - Attitudes (open ended questions)
  - Behaviors (steps)
  - Performance (pass/fail, steps, numerical)

Consensus Proceedings

- Address a knowledge gap
- IRB approval
- Track and categorize attendees
- Plan agenda
- Formal process to achieve consensus [Delphi]
- Millennium conferences
  - Teaching patient safety 2009
  - Educational research 2007
  - Medical simulation 2005

Qualitative Studies

- Explore and understand phenomenology
- **Non numeric narrative and visual data**
- Extensive interaction
- Small sample size
- Interviews, focus groups and free text responses from surveys

Qualitative Studies

- Theory building
- Inductive reasoning; record observations, identify patterns or themes, form hypotheses, and inform theory

Quantitative Studies

- Direct observation
- **Numeric data with statistical analysis**
- Little interaction
- Larger sample size to demonstrate statistical significance
- Descriptive studies and analytical studies

Quantitative Studies

- Theory testing
- Deductive reasoning; start with theory, guide research hypothesis, tested using objective measures and confirmed with statistical analysis

Educational Studies

- **Descriptive Studies**
  - Case reports / series
  - Correlational ecological
  - Cross sectional
- **Analytical studies**
  - Case control
  - Cohort / prospective studies
  - Randomized controlled trial

Educational Research Outcomes

- **Who are we looking at?**
  - Trainee [medical student/resident]
  - Faculty/educator
  - Patient
  - Provider [clinician / health care system]

- **What are we measuring?**
  - Performance [exams, procedures, reporting]
  - Satisfaction [opinions, feelings, beliefs, attitudes]
  - Professionalism [ethical, moral, and career choices, promotion, tenure]
  - Quality of life [activities of daily living]
  - Cost [financial implications]

Thank you for your time and attention!
Any questions or comments?
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Educational Outcomes