Primary Care Research Longitudinal [PR01]

Shahrzad Bazargan-Hejazi, PhD
Clerkship Chair
September 11, 2018
Session Objectives

• Differentiate between teaching approaches
• Identify different learning theories
• Monitor your learning approach
• Plan generating an effective research plan

• Recall goals and objectives of MSRTP
• Recall research deliverables for 3\textsuperscript{rd} and 4\textsuperscript{th} year
• Create a research question using EDP or PICOT
• Apply FINER criteria to refine a research question
• Develop collaboration and mentoring
• Identify criteria for co-authorship
Principles of Adult Learning

• **Pedagogy** = paidi (child) + ago (guide)
  • The art and science of helping adults learn.

• **Andragogy** = andras (man) + ago (guide)
  • The art and science of helping adults learn.
  • Malcolm Knowles (1970)

• Adult learners are different.
• It’s not like working with children.
• What is the common denominator between the trainer and the trainee?
  • Mutuality
    • Both trainer and learner are involved in creating a learning experience
Characteristics of Adult Learners
Knowles’s Assumption

- Control over learning (Self-directed).
- High motivation to learn.
- Pragmatic in learning.
- Learning may be a secondary role.
- Resistant to change.
- Adult learners are more diverse.
- Draw on past experiences in learning.
- Learning is often self-initiated.
- Learning is aimed at an immediate goal.

Houle, 1984; Ball, 1996
Benefit & Challenges of Adult Learning

• Studying out of choice/autonomous
• Pursue a subject that they are passionate about
• Intrinsic motivation is high
• Boost their energy
• Flexibility
• Peer support
• A lack of time, energy, resources, negative mindset
Learning Theories

• **Reinforcement theory:**
  • People are motivated to perform or avoid certain behaviors because of past experience based on that behavior.
    • Positive reinforcement.
    • Negative reinforcement.

• How can this theory be used in training?
• **Social Learning Theory**

• People learn by observing other people (models) they think are knowledgeable and credible.

• The model’s behavior is adopted.

• Self-efficacy: The individual must believe he or she is capable of learning.

• Four processes in learning:
  • Attention.
  • Retention.
  • Motor reproduction.
  • Motivation.

• How can this theory be used in training?
Goal Theories

• Goal-setting theory:
  • Behavior results from a person’s intentional goals and objectives

• Goal orientation:
  • Learning orientation.
  • Performance orientation.

• How can this theory be used in training?
Need Theories

• A need is a deficiency that a person experiences at a certain time.
• A need motivates a person to behave in a way that satisfies the deficiency.
• Need theory suggests that trainers should identify the trainee needs and communicate to them how the training will satisfy that need.

• How can this theory be used in training?
Expectancy Theory

• Behavior is linked to three factors:
  • Expectancies: The trainee’s belief that increasing effort will lead to higher performance.
  • Instrumentality: The trainee’s belief that performing a certain behavior will lead to an expected reward.
  • Valence: The value that the trainee places on the reward.

• How does this relate to training?
Information Processing Theory

• Information processing theory:
  • Information is taken in by the brain.
  • Information undergoes transformation.
  • Information is encoded into short-term or long-term memory.
  • Information is stored and available for later retrieval and use.
  • Feedback from the environment.

• How does this relate to training?
Training Design Challenge: Application of these theories into training

- Independent Project/Research
- Research Protocol Development
- Didactic Sessions
- Interactive Sessions
- Research elective
- Mock Presentation
- Formal Presentation
- Scholarship Day Poster Presentation
- CDU Annual Research Colloquium
- Thesis
Effective Research Plan (ERP)

• Why is it important
  • Allows to be strategic and planful in how things have to get done
  • Will get you out of “putting out the fire” mentality
  • You have clear expectations/articulated expectations
  • Better manage your time and resources
  • Optimizes your research activities/efforts
  • Assess your progress
  • Feels good when you achieve it
  • Increases you chances of success
  • Reduce the likelihood of unpleasant outcomes
Steps in Creating ERP

1. Self-assessment
   - Readiness
   - Strength /learning style
   - Opportunities
   - Challenges/learning style

2. Goal setting
   - Short-term or long-term goal in the plan
   - Can you do them?
   - Are they reasonable?
3: How do you intend to achieve your plan?
   • Take advantage of Impression management/outcome assessment
   • Use SMART goal setting:
     • Specific
     • Measurable
     • Achievable
     • Result-focused
     • Time-bound

4: What will prevent/permit me?
   • Identify obstacles
   • Identify your assets
   • Identify individual, people, groups, who can help you to overcome obstacles, achieve your goal

5: What are the benefit of achieving the goal(s)?

6. Do I have the skills/expertise to accomplish the goal(s)?
The Learning Cycle

• The learning cycle is a dynamic process that involves four specific stages:
  • Concrete experience.
  • Reflective observation.
  • Abstract conceptualization.
  • Active experimentation.

• The key to effective learning is to be competent in each of the four stages.
Why Are You Here?
Why do you have to do research?

- To participate in the development of new knowledge
- To learn how to evaluate research findings
- To develop habits of inquiry as a continuing professional responsibility
- To be more effective in acquiring, managing, and utilizing information for clinical decision-making
Overall Goal

Respond to the Institute of Medicine recent report, which points to critical shortage of Physician-researchers and highlights the need for competency-based curricula that promote research training during medical education training as a way to address that shortage.

Specific Goal

“To engage medical students in the systematic acquisition, organization, analysis, and interpretation of information that results in new knowledge, attitudes and skills essential to become excellent physicians, innovative medical care providers, and leaders in their fields.”
RESEARCH TRAINING LEARNING OBJECTIVES

• Conduct ethical research.[1,2]
• Show competency in accessing and using appropriate electronic databases to conduct a literature review. [3]
• Use bibliographic software for referencing, and to access published works. [3]
• Develop and manage an scholarly project. [4-6]
• Demonstrate competency in scientific reasoning, interpretation of scientific data, to critically appraise existing medical information, appraise scientific evidence, evaluate current practices, and improve clinical practices. [5]
• Use information technology to manage information, access on-line medical information; and support their own education.[5]
• To effectively communicate and exchange scientific findings.[6]

ACGME CORE COMPETENCIES

Demonstrate:
1. Professionalism
2. Compassionate Patient Care
3. Medical Knowledge
4. Systems-based Practice
5. Practice based Learning and Improvement
6. Interpersonal and Communication Skills
Health Disparity Research

• *Health Disparity research* examines a broad spectrum of biological, socioeconomic, environmental, and other factors that contribute to the presence or absence of physical, mental, and social health and well-being disparity.
Health Research Purposes

• Needs assessment (community health profiles)
• Risk assessment (risk factors for disease)
• Applied practice (clinical effectiveness)
• Outcomes evaluation (impact of interventions)
Types of Research

- Biobehavioral/Psychosocial
- Health Services Research
- Quality Improvement Research
- Public Policy Research
- Bench Research
The Research Process

• **Research** is the process of systematically and carefully investigating a subject in order to discover new insights about the world.

• **Five steps**
  1. Identify a study question.
  2. Select a general study approach.
  3. Design the study and collect data.
  4. Analyze data.
  5. Write and share a report about the findings.
Identifying a Research Question

• Reflect
  • Value
  • Skills
  • Personal growth
  • Connections
  • Course requirements

• Brainstorm
  • Critically review the existing literature
  • Talk to your peers, faculty, experts
  • Attend meetings, conferences, network sessions
  • Create a long list of possible research topics

• Evaluate:
  • Does it have EDP components?
  • Does it have PICOT components?
  • Does it meets FINER criteria?
Exposure, Disease, Population (EDP)

• The “EDPs” form the basis for many research questions: “Is [exposure] related to [disease/outcome] in [population]?”
# Examples of Types of Exposures

<table>
<thead>
<tr>
<th>Socioeconomic Status</th>
<th>Health-Related Behaviors</th>
<th>Health Status</th>
<th>Environmental Exposures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>Dietary practices</td>
<td>Nutritional status</td>
<td>Drinking water</td>
</tr>
<tr>
<td>Wealth</td>
<td>Exercise habits</td>
<td>Immune status</td>
<td>Pollution</td>
</tr>
<tr>
<td>Educational level</td>
<td>Alcohol use</td>
<td>Genetics</td>
<td>Radiation</td>
</tr>
<tr>
<td>Occupation</td>
<td>Tobacco use</td>
<td>Stress</td>
<td>Noise</td>
</tr>
<tr>
<td>Age</td>
<td>Sexual practices</td>
<td>Anatomy and anatomical defects</td>
<td>Altitude</td>
</tr>
<tr>
<td>Sex/gender</td>
<td>Contraceptive use</td>
<td>Reproductive history</td>
<td>Humidity</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td>Hygiene practices</td>
<td>Comorbidities (existing health problems)</td>
<td>Season</td>
</tr>
<tr>
<td>Nationality</td>
<td>Religious practices</td>
<td></td>
<td>Natural disasters</td>
</tr>
<tr>
<td>Immigration status</td>
<td>Use of health-care services</td>
<td></td>
<td>Population density</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td>Travel</td>
</tr>
</tbody>
</table>
## Examples of Types of Diseases

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Communicable/Infectious Diseases</th>
<th>Noncommunicable/Chronic Diseases</th>
<th>Neuropsychiatric Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone fractures</td>
<td>Candidiasis</td>
<td>Asthma</td>
<td>Alzheimer’s and other dementias</td>
</tr>
<tr>
<td>Burns</td>
<td>Cholera</td>
<td>Cancers</td>
<td>Autism</td>
</tr>
<tr>
<td>Crush injuries</td>
<td><em>E. coli</em></td>
<td>Cataracts</td>
<td>Depressive disorders</td>
</tr>
<tr>
<td>Frostbite</td>
<td>Hookworm</td>
<td>Diabetes</td>
<td>Post-traumatic stress disorder</td>
</tr>
<tr>
<td>Gunshot wounds</td>
<td>Malaria</td>
<td>Hypertension</td>
<td>Schizophrenia</td>
</tr>
<tr>
<td>Near drownings</td>
<td>Syphilis</td>
<td>Osteoporosis</td>
<td></td>
</tr>
<tr>
<td>Poisonings</td>
<td>Tuberculosis</td>
<td>Stroke</td>
<td></td>
</tr>
</tbody>
</table>
Examples of Types of Populations

- Inner city children younger than 18 years old
- Women living in under resourced area
- Adults with history of interpersonal violence
- Psychiatrist with at least 10 years of practice
- Individuals newly diagnosed with Post Traumatic Disorder
“EDP” Research Questions

• Is financial burden [exposure] related to the risk of mental disorders [disease] in families of children with congenital heart disease [population]?

• Is depression [exposure] related to the risk of hospitalization for diabetes [disease] in women younger than 35 years old [population]?

• Is poor family function [Exposure/Predictor] related to the risk of suicide attempt [disease/outcome] in adolescent age 13-18 visiting an inner-city emergency department?
“PICOT” is often used for clinical research

- Patient/Population
- Intervention
- Comparison
- Outcome
- Timeframe
Checklist for Success

• Good research projects are described by the acronym “FINER”:
  • Feasible
  • Interesting
  • Novel
  • Ethical
  • Relevant
FINER Criteria for a Research Question

•F = Feasible
  •Adequate # of subjects
  •Adequate technical expertise
  •What new skills you have to develop?
  •Affordable in time, money
  •Manageable in scope
  •‘F’ helps to know your limits early on, so as to avoid wasting time and effort over something that is not going to work
I = Interesting 😎

Is answering the question interesting?

• What are your interest?
• What research topics are potentially meaningful to you?
• Are you interested in the topic because it could potentially benefit someone you care about?
• You are interested in the topic because it reflect injustice in the community?
• Is it worth studying

• Confirm whether the question is interesting with your faculty mentor before investing energy and time in developing and implementing it.
FINER Criteria (cont.)

😊 N = Novel

- It contributes to new information by
  - Confirming or refuting previous findings
  - Extending previous findings
  - Providing new findings
  - Does it fill a gap in the literature
- You should be able to answer the “so what” question
E = Ethical

- A good research question should be ethical
- It should not pose unacceptable physical risk to the subjects or cause an invasion of their privacy
- *If it does, find some other way to answer your research question*
FINER Criteria (cont.)

😄 R = Relevant

Are the anticipated outcomes of the study relevant to
• Advancing scientific knowledge?
• Clinical management?
• Health policy?
• Guiding future directions in research?
• Relates with CDU Mission, CDU advantage, etc.
The RQ does not meet the FINER criteria

😊 Not feasible
  • Too broad!!!
  • Not enough subject available!!!
  • Method beyond your skills!!!
  • Too expensive!!!

😊 Not interesting, novel, or relevant
  • Consult with your mentor
  • Modify RQ

😊 Uncertain ethical suitability
  • Consult with IRB
  • Modify your methods/procedures
Exercise

Develop two research questions based on EDP & PICOT, which meets FINER criteria.
Possible Answer

• Among college freshmen, does depression assessed by the CES-D predict health status measured by the Rand General Health Questionnaire four years later?

• Does depression assessed by the CES-D [exposure] predict poor physical health measured by Rand General Health Questionnaire [Disease] four year later in young athletics?
Collaboration and Mentorship

• Scientific research is rarely completed by one person working alone.
• Ask colleagues, classmates, and others about who might be a helpful mentor.
• Search the profiles of researchers at one’s own institution to see who is publishing on relevant topics.
• E-mail potential mentors and ask to meet to discuss possible collaborations.
• CTSI
• AXIS
• Cancer Center
• RTRN
• CRECD
The Mentor–Mentee Relationship

What mentees need to know:
• How much time does the mentor have for mentorship?
• How does the mentor communicate?
• What roles does the mentor agree to take on?
• What resources does the mentor agree to provide?
• What expectations does the mentor have of the mentee?
The Mentor–Mentee Relationship

What mentees need to do:
• Communicate often
• Ask questions
• Complete assigned tasks on time
• Be honest
• Maintain meticulous records
• Express gratitude
Professional Development

• Do not rely on one person to provide professional development and mentoring.
• Participate in journal clubs.
• Become active in professional organizations.
• Attend and present at research conferences.
• Enroll in training programs.
Coauthoring

• Most researchers start as “middle authors” before becoming a lead (first) author for the first time.
• Decisions about who qualifies for co-authorship should be transparent.
Authorship Criteria

• ICMJE criteria for authorship in the health sciences
• All FOUR criteria must be met:
  1. Substantial contributions to the conception and design of the study and/or data collection, analysis, or interpretation
  2. Drafting and/or critically revising the intellectual content of the manuscript
  3. Approve the final version of the manuscript to be submitted
  4. Accept responsibility for the integrity of the paper
Authorship Order

• The first author (lead author) usually takes responsibility for most of the writing.
• Middle authors are listed in order from greatest to least contribution or alphabetically by family name.
• The senior author (supervising author) often is listed last.

Make decisions about authorship early to avoid surprises and stress.
Research Approach

• Quantitative Research
  • Cross sectional
  • Case control
  • Cohort
  • Experimental

• Secondary Data Analysis:
  • Publicly available secondary data: Analyze existing data
  • PI-generated: Join an on-going study to foster research skills and experience and provide evidence of independent intellectual contribution
  • Electronic medical records

• Systematic Review: Choose a topic to understand it in depth

• Quality Control: Join a community-based health clinic to understand the demographics, health related issues, access, and resources of that community and leave behind a valuable contribution

• Qualitative Study: Focus-group; elicitation interview
Andragogy Model/Adult Learning

• Is based on several assumptions:
  • Adults have the need to know why they are learning something.
  • Adults have a need to be self-directed.
  • Adults bring more work-related experience into the learning situation.
  • Adults enter into a learning experience with a problem-centered approach to learning.
  • Adults are motivated to learn by both extrinsic and intrinsic motivators.

Noe (2008) pg. 133
Knowles’ Assumptions of Adult Learners

1. **Self-concept**
   - As a person matures his/her self concept moves from one of being a dependent personality toward one of being a self-directed human being.

2. **Adult Learner Experience**
   - As a person matures he/she accumulates a growing reservoir of experience that becomes an increasing resource for learning.

3. **Readiness to Learn**
   - As a person matures his/her readiness to learn becomes oriented increasingly to the developmental tasks of his/her social roles.

4. **Orientation to Learning**
   - As a person matures his/her time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his/her orientation toward learning shifts from one of subject-centeredness to one of problem-centeredness.

5. **Motivation to Learn**
   - As a person matures the motivation to learn is internal (Knowles 1984:12).

Practical Questions

• Questions derived from clinical practice, community observations, and personal experience often point toward an unmet demand for needs assessments, program evaluations, and clinical effectiveness studies.

• A good research question ends in a question mark and is testable.