The Research Process in 9 Steps
Outline

1. DERS overview
2. Definition of Research
3. Overview of Research Process – 9 steps
4. Sources of Research Questions
5. Forming, refining and assessing research question
6. Tools
Objectives

- Understand the nine major components of the research process
- Understand how to formulate your idea into a researchable question
- Understand how to assess the feasibility and relevance of research question
DERS Website:
http://fraserhealth.ca/research

Key Features:
- How to get started
- How we can help
  - Description of services and contacts
- Tons of resources!
  - Research Toolkit
  - Clinical Research Start-up Toolkit
- Research Study Database
# FH Research Study Database

- **FH REB #**: 2014-018
- **Study Title**: Enhancing the Mentor-Mentee Relationship For Royal Columbian Hospital Emergency Department Nurses
- **Researcher Name**: ASKEW, Jackie
- **Researcher Title**: RN
- **Program**: Emergency
- **Researcher Discipline**: Nursing
- **FH Site Name**: RCH
- **Research Area**: Emergency
- **Research Type**: Non-Clinical
- **Clinical Trial Registration #**: 
- **Name of Funder**: Unfunded
- **Research Study Status**: Completed
- **Date of FH REB Initial Approval**: 20-Mar-2014
- **Date of FH REB Annual Renewal**: 
- **Date of FH REB Study Completion**: 27-Oct-2014
- **Letter of Authorization (LOA) Date**: 20-Mar-2014
- **Documents**: 
  - [2014-018 Abstract Executive Summary.pdf](http://researchdb.fraserhealth.ca/ersweb/)
FH Methodology Unit
How can we help?

Research Development Specialist

- Conducting a search for funding opportunities
- Targeted notification of new funding sources and deadlines
- Identifying a research team
- Preparing letters of intent
- Identifying resources required for conducting research
- Formulating the research budget
- Facilitating proposal development in collaboration with researchers
- Understanding FH and funding agency requirements regarding preparation of specific documents
- Administration of funding awards
FH Methodology Unit
How can we help?

Epidemiologist
Protocol Development Services
- Refine ideas into a researchable question
- Refine project objectives, questions & hypothesis
- Develop study methods: study design, sample size calculation, analyses plan

Statistical Analyses Services:
- Database design, data analyses and interpretation of results

Project Dissemination Services:
- Posters, power point presentations & manuscript development
Facilities Bargaining Association joint committee on health and safety risks associated with shift work.

Employees covered by the Facilities Collective Agreement are being asked to complete an online survey.
Fraser Health Library Services

“... Supporting patient care through access to information”

Your largest libraries (most resources & full staffing)

- ARHCC
- BUH
- CGH
- RCH
- SMH

Other Library Spaces

- Ridge Meadows Hospital

Remote Access

- Send an email to Library@fraserhealth.ca for prompt assistance across the region
BC SUPPORT Unit Fraser Centre

- Provides services to support patient-oriented research and knowledge translation
- Partnership between regional Health Authorities and their local universities
  - Fraser Centre = FH and SFU
- Part of Canada’s Strategy for Patient-Oriented Research (SPOR)
Services and Supports

Research Navigator Leader
• Refine POR research questions & research design
• Navigate FH and SFU research services
• Facilitate links & collaborations across institutions

Patient Engagement Specialist
• Recruit patient partners and participants
• Capacity building in POR
• Support multidisciplinary research teams

Knowledge Translation Specialist
• Knowledge Translation (KT) capacity development
• Develop KT strategy for applications and projects
• Support doing KT activities and creating KT products
Access to Fraser Centre Services

Fill out an inquiry form at bcsupportunit.ca

What's patient-oriented research?

Research that is done in partnership with patients, answers research questions that matter to patients, and aims to improve health care.

Join us on November 9th! Putting Patients First: Partnerships for Better Health Research Provincial Conference
Differences Between Research, Evaluation and QI

Research
For discovery purposes
‘new knowledge’ that can be applied to the wider population

Evaluation
For ‘business’ purposes
ensuring the intervention was implemented as planned and is meeting its goals

Quality Improvement
For maintaining fidelity
determine how this intervention affected this participant group in this setting
Research Basics

- You have a question that you think would make an interesting research study
- What should you do?
  - Question?
  - Study?
- It is important to understand research basics before beginning the research process

Proto-Professor Algarth Zag, pioneer in fire research.
Research Process

1. Generate idea
2. Conduct literature review
3. Refine research question
4. Plan research methodology
5. Create research proposal
6. Apply for funding
7. Apply for ethics approval
8. Collect and analyze data
9. Draw conclusions and relate findings
Step 1: Generate research idea

- Identify area/topic of interest?
- Do some reading on the area of interest
- Write a list of some ideas or possible questions
- Choose a main research question
- Has this research been done before?
Step 2: Conduct literature review

- A systematic process of capturing what is known on a particular topic
  - To understand state of current knowledge
  - To identify gaps, limitations or inconsistencies

- A process of summarizing “synthesizing” results
  - Draw a conclusion about what is known/not known, similarities/differences between studies, highlight findings
  - Use critical appraisal tools to evaluate quality of evidence

To ensure that the question has not been already examined
Step 2: Conduct literature review

- Search books, journal articles and grey literature on your topic
- See reference sections for other relevant articles

FH Library Services can help you:
- Focus your research question
- Aid in your search, including facilitating offsite access to databases
- Assist with article retrieval
Step 3: Refine research question

- General idea is formulated into an answerable research question
- Narrow down the topic
- Start thinking in more detail:
  - Focus: re-state the problem or research question
  - Specify: who, where, when, and what
- Ensure question is relevant, realistic & feasible
Step 4: Plan research methodology & Design

- Describe how the research will be carried out
- Select methodology to allow you to answer your research question: qualitative vs quantitative
- Select methods and tools

Consider:
- Study participants and sampling methods
- Measures & measurement methods
- Procedure for accessing data
- Procedure for interventions
- Sample size justification
- Analysis plan
- Dissemination of results
Step 5: Create research proposal

- Will enable people who are not involved in the study to understand exactly what you plan to do

- A proposal will be required for:
  - seeking departmental approval
  - applying for grant funding
  - ethics review
Step 5: Create research proposal

Proposal should include:
- abstract
- background information
- question & goals & objectives & hypotheses
- justification & relevance
- research design, subjects, measures, data collection procedure, sample size justification, data analysis
- KT plan
- (may include budget + other sections)
Step 6: Applying for grant funding

- Often possible to apply for funding for research study
- Funders require a detailed research proposal
- Consult with the FH DERS Methodology Unit early
- Contact Kate Keetch, Research Development Specialist, for further information regarding grant writing
  kate.keetch@fraserhealth.ca
Step 7: Ethics approval

- Ethics is essential when dealing with human subjects or health data
- The Fraser Health Research Ethics Board (REB) reviews submissions on a regular basis
- See the Fraser Health Research homepage for more information and guidelines
  http://fraserhealth.ca/research
Step 8: Collect and analyze data

- Collecting data for your study is exciting
- Goal is to generate reliable results
- Follow your study design and methods
- Exercise care in the collecting, coding and documentation of data
- Follow your analysis plan
Step 9: Draw conclusions and relate findings

- Summarize your findings and formulate conclusions
- Was your research question answered?
- Why do you think this was the case?
- What were the limitations of your study?
- What new information was gained that would inform future research?
- Prepare presentation, poster and / or manuscripts, liaise with stakeholders, etc.
What does “patient-oriented” mean?

- Engages patients as partners (i.e. as team members), focuses on patient-identified priorities, and improves patient outcomes
- Aims to apply knowledge generated to improve health care systems and practices
- Patients include anyone who has experience with the health care system or a health issue, and informal caregivers
## Potential Patient Activities

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority-setting</td>
</tr>
<tr>
<td>Formulating a study question</td>
</tr>
<tr>
<td>Identifying study population</td>
</tr>
<tr>
<td>Recruitment</td>
</tr>
<tr>
<td>Determining consent procedures</td>
</tr>
<tr>
<td>Designing interventions</td>
</tr>
<tr>
<td>Choosing outcomes that are important to the population of interest (e.g. survival, function, symptoms, quality of life, etc.)</td>
</tr>
<tr>
<td>Study design</td>
</tr>
</tbody>
</table>
## Potential Patient Activities

<table>
<thead>
<tr>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>Data collection (e.g. conducting interviews and focus groups)</td>
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<tr>
<td>Data analysis</td>
</tr>
<tr>
<td>Interpretation of findings</td>
</tr>
<tr>
<td>Designing/suggesting plans for dissemination and implementation activities</td>
</tr>
<tr>
<td>Actual dissemination of research results (e.g. presentations, social media, etc.)</td>
</tr>
<tr>
<td>Translating documents into plain language</td>
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<tr>
<td>Evaluation</td>
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<tr>
<td>Peer Review</td>
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</table>
It’s all about getting perspective
Research Process

1. Generate idea
2. Conduct literature review
3. Refine research question
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7. Apply for ethics approval
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Generating, Assessing and Refining the Research Question

"You can tell whether a man is clever by his answers. You can tell whether a man is wise by his questions."

Naguib Mahfouz
Generate Research Idea

- Research begins with the identification of a problem/knowledge gap and formulation of a research question
  - Identifying this problem can be the hardest part of research
  - It does not have to be complex
Generate Research Idea

Where to obtain a research idea

- Experience in your area of specialty
- Knowledge of the relevant literature and issues
- Practice guidelines
- Journal editorials and review articles
- Department strategic priorities
- Peers
Group Exercise 1: Generating the research question

Working in small groups, come up with 2 research questions or topics of interest to you.
Assessing the Goal

- **What is your primary goal?**
  - **Describe** – when little is known about the characteristics of a problem, patient group, health care providers or a health service/system
  - **Associate** – when you want to assess if certain factors are linked with a well described problem
Assessing the Goal

- **What is your primary goal?**
  - **Predict** – when you want to understand the extent to which certain factors contribute to or cause a problem
  - **Compare** – when you wish to assess the impact of an intervention or to determine if there are differences between interventions or characteristics of various groups (e.g., differences between patients or health services)
## Building a Program of Research

<table>
<thead>
<tr>
<th>State of Knowledge</th>
<th>Type of Research Question</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem is new or characteristics of problem not well defined.</td>
<td>Describe</td>
<td>What are the characteristics?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To what extent is this observed?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What are the experiences?</td>
</tr>
<tr>
<td>Possible linkages between problem and other relevant factors.</td>
<td>Associate</td>
<td>Is there an association?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What are the correlates?</td>
</tr>
<tr>
<td>Determine the extent to which other characteristics influences the problem.</td>
<td>Predict</td>
<td>What are the predictors?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What are possible causes?</td>
</tr>
<tr>
<td>Identify differences between groups.</td>
<td>Compare</td>
<td>Do differences exist?</td>
</tr>
<tr>
<td>Determine effects of interventions.</td>
<td></td>
<td>Is the treatment effective?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does the condition change over time?</td>
</tr>
</tbody>
</table>
Group Exercise 2: Assessing the goal

Working in your groups, examine your list of research ideas/questions and assess how they fit with the four main goals of describe, associate, predict and compare.
Refining the Research Question

Define the key components of the question

<table>
<thead>
<tr>
<th>P</th>
<th>specific patient population of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>intervention or issue of interest</td>
</tr>
<tr>
<td>C</td>
<td>comparison with another intervention/issue</td>
</tr>
<tr>
<td>O</td>
<td>outcome of interest</td>
</tr>
<tr>
<td>T</td>
<td>timeframe (optional)</td>
</tr>
</tbody>
</table>
Formulating the Question

\[ P = \text{Patient or Population} \]
I = Intervention
C = Comparison
0 = Outcome
T = Time (quantitative)

The time it takes for the intervention to achieve the outcome
Formulate question using PICO(T)
In women with suspected coronary disease, what is the accuracy of ECHO exercise testing, compared to exercise ECG, for diagnosing coronary artery disease?
## Reformulate question

<table>
<thead>
<tr>
<th>P</th>
<th>Females who are suspected of having coronary disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>ECHO exercise testing</td>
</tr>
<tr>
<td>C</td>
<td>Exercise ECG</td>
</tr>
<tr>
<td>O</td>
<td>Accurate diagnosis of Coronary Artery Disease</td>
</tr>
</tbody>
</table>
Answerable Question

- For females with suspected coronary disease, is there any evidence that a ECHO exercise testing provides better accuracy in diagnosis of coronary artery disease compared to ECG exercise testing?

- In female patients with suspected coronary artery disease, what is the accuracy of ECHO exercise testing compared with ECG exercise testing?
Qualitative Research

- An exploratory approach
  - To understand meaning through description
  - Experiences, perceptions, feelings, motives
  - Narratives, phenomenologies, ethnographies, grounded theory, case studies
  - Not frequency
# Qualitative Research

<table>
<thead>
<tr>
<th>Qualitative Approach</th>
<th>Example Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrative</td>
<td>How does a good everyday life come about when living with chronic rheumatic conditions?</td>
</tr>
<tr>
<td>Phenomenology</td>
<td>What role does the therapist’s spirituality play in the treatment of his or her patients?</td>
</tr>
<tr>
<td>Grounded theory</td>
<td>What are the attitudes of elderly people with stroke towards the daily use of assistive devices and technologies?</td>
</tr>
<tr>
<td>Case study</td>
<td>What strategies are being used by small businesses that have effective and viable workplace wellness programs?</td>
</tr>
</tbody>
</table>

Example questions from http://unstick.me/qualitative-research-question-examples/nts
SPICE

For qualitative research SPICE may be more useful:

- **SETTING**
- **PERSPECTIVE**
- **INTERVENTION/INTEREST**
- **COMPARISON**
- **EVALUATION**

http://www.jbiconnect.org/connect/info/about/jbi_ebhc_approach.php
SPICE

- SETTING – In acute care
- PERSPECTIVE – Patients with diabetes
- INTERVENTION/INTEREST – recommendations for weight management from clinicians
- COMPARISON – Not Applicable
- EVALUATION – perceptions

Example: What are the perceptions of patients with diabetes in acute care about information they receive from clinicians about managing their weight?
Group Exercise 3: Refining the Research Question

Choose one research question and refine using PICO or SPICE

P  Population/Patient
I  Intervention
C  Comparison
O  Outcome
S  Setting
P  Perspective
I  Intervention/Interest
C  Comparison
E  Evaluation
Assessing Your Research Question
FINER Criteria for a Good Research Question
(from Designing Clinical Research, by Stephen Hulley and Steven Cummings, 1988)

Feasible - Adequate number of subjects.
  - Adequate technical expertise.
  - Affordable in time and money.
  - Manageable in scope.

Interesting - To the investigators.

Novel - Confirms or refutes previous findings.
  - Extends previous findings.
  - Provides new findings.

Ethical

Relevant - To scientific knowledge.
  - To clinical and health policy.
  - To future research directions.
Obtain Feedback

- Write down your research question
- Prepare a 1 or 2 page summary of the rationale and draft research plan
- Obtain feedback from peers, colleagues, decision makers
- Seek consultation with Evaluation and Research Services
Questions?
Thank You!

Department of Evaluation and Research Services

www.tamdarius.com

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