Research Planning Worksheets

Developed by the
M.S.U.
Primary Care
Faculty Development Fellowship Program

The Research Question

In the space provided below, write three potential research questions you would be interested in studying. As you continue, you will refine and clarify your research question.

1._____

_____

_____

2._____

_____

_____

3._____

_____

_____

The characteristics of a good research question are that it be feasible, interesting, novel, ethical, and relevant. These words form the mnemonic *FINER*. Evaluate your potential questions according to the *FINER* criteria.

RESEARCH QUESTIONS

	1	2	3
	(Yes No)	(Yes No)	(Yes No)
Feasible			
Adequate numbers of subjects	_____	_____	_____
Adequate technical expertise	_____	_____	_____
Affordable in time and money	_____	_____	_____
Manageable in scope	_____	_____	_____
Interesting			
To the investigator	_____	_____	_____
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	_____	_____	_____

In the space provided below, write three potential research questions you would be interested in studying. As you continue, you will refine and clarify your research question.

1._____*Are older patients without coronary heart disease concerned about cholesterol and heart disease?*_____

_____

2._____*Do physicians vary in their attitudes toward managing blood lipid levels and do those attitude differences affect behavior with patients?*_____

_____

3._____*What are the risk factors for coronary heart disease in Greek adults?*_____

_____

_____

The characteristics of a good research question are that it be feasible, interesting, novel, ethical, and relevant. These words form the mnemonic *FINER*. Evaluate your potential questions according to the *FINER* criteria.

RESEARCH QUESTIONS

	1	2	3
	(Yes No)	(Yes No)	(Yes No)
Feasible			
Adequate numbers of subjects	y	y	y
Adequate technical expertise	y	y	y
Affordable in time and money	y	y	y
Manageable in scope	y	y	y
Interesting			
To the investigator	y	y	n
Novel			
Confirms or refutes previous findings	y	y	y
Extends previous findings	y	y	y
Provides new findings	y	y	y
Ethical	y	y	y
Relevant			
To scientific knowledge	y	y	y
To clinical and health policy	y	y	y
To future research directions	y	y	y

Research question:

_____

_____

1. Describe the target population.

_____

_____

_____

2. Describe the accessible population.

_____

_____

_____

3. List the inclusion criteria you will use.

_____

_____

_____

4. List the exclusion criteria you will use.

_____

_____

RESEARCH TRACK WORKSHEET: Choosing the Study Subjects
Sample of completed worksheet

Research question:

How often do primary care providers discuss osteoporosis prevention and calcium intake with women during their health maintenance examinations?

1. Describe the target population.

Women patients (adults) who come for an annual health maintenance examination at a family practice clinic.

2. Describe the accessible population.
Adult women patients registering for an annual health maintenance examination with a participating (in the study) provider at 8 Wisconsin family practice clinics

3. List the inclusion criteria you will use.

Women -18 to 65 years, registering for annual health maintenance examination who agree to be interviewed. Must be patients of a provider at the clinic participating in the study.

Providers – all faculty physicians, physician assistants, nurse practitioners, and second –year residents in each clinic who agree to participate

4. List the exclusion criteria you will use.

        None

Research Design

Research question:

_____

_____

Thinking through design

1. What is the **purpose** of your research question?

    (a) Are you **observing** phenomena passively or are you **intervening** in some way?

2. If this is an **observational** type of question:

    (a) Are you going to simply **describe** what you observe, or are you intending to **compare** two or more factors?

    (b) If you intend to **compare** two or more factors, what is your **hypothesis**? (Hint: Your research question and this hypothesis should be the same or very similar.)

    (c) Are you looking at measures over time?

3. If this is an **interventional** type of question:

    (a) What is your **hypothesis**? (Hint: Your research question and this hypothesis should be the same or very similar.)

4.   Based on your answers to questions 1-3, list research designs that would
     be appropriate to the purpose of your question, along with their <u>general</u>
     strengths and weaknesses.

Type of research design	Description	Strengths	Weaknesses

5.   What research designs would **not** be appropriate to your research
     question? Why?

6.   Of the designs you listed in the table for question 4, what **factors** related
     to your **research subjects** might eliminate one or more of these designs
     from consideration?

Research question:
What are the outcomes of patients admitted to the hospital with a diagnosis of Transient Ischemic Attack (TIA)?

Thinking through design

1. What is the **purpose** of your research question?

    (a) Are you **observing** phenomena passively or are you **intervening** in some way?
    Observing outcomes - no intervention.

2. If this is an **observational** type of question:

    (a) Are you going to simply **describe** what you observe, or are you intending to **compare** two or more factors?
    I wish to do both, actually. My main purpose is to describe how frequently certain outcomes occurred (like stroke), but I also wish to compare demographic factors of the patients to their outcomes.

    (b) If you intend to **compare** two or more factors, what is your **hypothesis**? (Hint: Your research question and this hypothesis should be the same or very similar.)
    My main purpose reads like a descriptive question rather than a comparison. But a secondary research question may be, "Is there a difference in the proportion of male vs. female patients with TIA who go on to have a stroke within 7 days?" (Stroke is one of my outcome measures.) The null hypothesis would be: "There is no difference in the proportion of male and female patients with TIA who go on to have a stroke within 7 days." I will write a hypothesis for each comparison I wish to make.

    (c) Are you looking at measures over time?
    Yes, I think it could be prospective or retrospective.

3. If this is an **interventional** type of question:

    (a) What is your **hypothesis**?   (Hint: Your research question and this hypothesis should be the same or very similar.)
    N/A

4. Based on your answers to questions 1-3, list research designs that would be appropriate to the purpose of your question, along with their <u>general</u> strengths and weaknesses.

Type of research design	Description	Strengths	Weaknesses
Cohort	Follow a group of subjects over time, measuring outcomes and risk factors. Can be done prospectively or retrospectively.	Allows measurement of incidence of outcomes. Good for common outcomes.	<u>Prospective</u> - More time consuming and costly. <u>Retrospective</u> - I have less control over subject enrollment and recording of chart information.
Case-control	Identify one group of patients with an outcome (cases), another group without the outcome (controls), and look back to compare frequency of risk factors between the two groups.	Good for rare outcomes - faster, less expensive.	Not for measuring incidence or prevalence. Proper selection of controls is critical.
Cross-sectional	Measuring subject variables at a single point in time. Can determine prevalence of an outcome or risk factor.	Fast, inexpensive, no loss to follow-up. Good for common outcomes.	Difficult to make causal inferences between risk factor and outcome.

5. What research designs would **not** be appropriate to your research question? Why?

   A **clinical trial**. <u>I am not going to intervene with the subjects.</u>

   <u>Even though I listed it in the table above, a **case-control design** does not seem appropriate to my research question. I want to establish frequency</u>

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of outcomes, like incidence of stroke, and I can't do that with a case-control design.

A **cross-sectional design** doesn't seem to make sense with my research question. I want to know what happens after the TIA so I'm looking over time at something. A cross-sectional study looks at one moment in time. If all I wanted to know was how many patients had a stroke in the hospital in March, that would lend itself to a cross-sectional design.

6.   Of the designs you listed in the table for question 4, what **factors** related to your **research subjects** might eliminate one or more of these designs from consideration?

Potential subject issues:

Access to patients (relates to adequate number of subjects/sample size)
    I have checked with the emergency dept, and they admit 2-3 patients per week with diagnosis of TIA. The medical records of these patients would be accessible to me.

Obtaining a representative sample of the population of patients with TIA
    Our hospital emergency department draws about 70% of ED visits among the hospitals in our city. I will need to inquire with the neurology department to see if certain physicians routinely send their patients with possible TIA somewhere else, which might introduce a systematic bias in the sample.

Inclusion criteria
    Right now my inclusion criteria are any patient admitted through the hospital Emergency Department with a diagnosis of TIA.

Exclusion criteria
    I'm still working on this, but I think I would exclude anyone with a previous history of stroke. I don't see the inclusion or exclusion criteria eliminating the use of a cohort study design.

Ethical concerns
    My study will not involve diagnosis or treatment of patients. An observational study has a low risk of harm to the subjects.

Summary:
Either a prospective or retrospective cohort design would be appropriate to my research question. However, I am eliminating prospective cohort design for the following reasons: A prospective study would take longer to generate the sample size that I need and it would be more work. I'd have to actively monitor admissions on a weekly basis to identify potential subjects, then find their

charts after they were discharged and abstract the information I wanted. I might also lose track of some patients. That leaves me with a retrospective cohort design as the most feasible and logical choice.

Operational Definitions

Research question: _____

_____

_____

List the terms in your research question that require specification and provide operational definitions.

TERM	OPERATIONAL DEFINITION

	Operational Definitions
	Sample of completed worksheet.

Research question: <u>How often do primary care providers discuss osteoporosis prevention and calcium intake with women during their health maintenance examinations?</u>

List the terms in your research question that require specification and provide operational definitions.

TERM	OPERATIONAL DEFINITION
primary care providers	all faculty physicians, physician assistants, nurse practitioners and second-year residents in each clinic
Osteoporosis prevention	any discussion with provider about osteoporosis risk factors and prevention – survey question – Did your provider talk to you about osteoporosis today?
Calcium intake	Any discussion with provider about calcium intake – survey question – Did he/she talk to you about your calcium intake?
Health maintenance examinations	scheduled examination for health maintenance

Instruments I

Variable Name	Operational Definition	Source of Information	Type of Question or Type of Response	Level of Measurement [1]	Validity of Infor-mation [2]	Reliability of Infor-mation*

[1] Nominal, Ordinal, Continuous
[2] High, Medium, Low

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Variable Name	Operational Definition	Source of Information	Type of Question or Type of Response	Level of Measurement [1]	Validity of Information[2]	Reliability of Information*
high fiber diet	X grams of fiber ingested per day	Patient diet diary	Check list of items	continuous	Medium	High

[1] Nominal, Ordinal, Continuous
[2] High, Medium, Low

Instruments II

Variable Name	Level of Measurement	How recorded?	Number of Spaces	Response Categories	Validation Plan

Variable Name	Level of Measurement	How recorded?	Number of Spaces	Response Categories	Validation Plan
High fiber diet	continuous	Fill in blank		grams	10 grams<x> 0 grams

Variable Name	Univariate Statistic	Comparison Variable (if applicable)	Statistic type for comparisons

Variable Name	Univariate Statistic	Comparison Variable (if applicable)	Statistic type for comparisons
High fiber diet	Mean	Predictor variable for CV risk	Pearson correlation coefficient