From Madness to Methods: Designing Your First Research Study

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Disclosure

The presenters declare that they do not have a current financial relationship with any non-eligible entities (commercial interests) that may have a direct interest in the subject matter of the CME program.

Objectives

01
Develop a specific research question

02
Define a study population and sampling strategy

03
Operationalize the variables associated with the research question

04
Develop a statistical analysis plan

01

Develop a specific research question

Research ideas arise from....

- Patient encounters

- Practice needs

- Professional issues

- Personal challenges

- Prior publications

Our scenario for today...

During a trip to the local coffee shop, you meet with one of your former classmates who works at a local urgent care. He states that even though you graduated only five years ago, he is thinking of either changing specialty or getting out of PA practice...maybe going into PA education. He thought that when Covid slowed down things would get back to normal, but it seems worse lately. Even his wife has complained that he is "no longer fun to be around" and gets annoyed easily. Is this burnout?

He notes that you seem to be enjoying your job and asks what your secret is.

Problem statement

Potential problem statements*

- There is a significant amount of burnout in health care providers.

- There is a significant amount of burnout in PA students

  - System issues (workload, staffing, EHR demands) may contribute to or protect from burnout

  - Individual characteristics contribute to or protect from burnout (e.g., resilience)

  - Burnout needs to be better defined

*Note: part of your review of the literature task is to establish evidence for the statement you choose.

Review of the literature

What is known about the topic of clinician burnout?

What remains to be known?

What do **you** want to know more about?

What type of question would you like to ask?
- Prevention
- Diagnosis/Identification
- Epidemiology, Risk Factors, Etiology
- Intervention/Treatment
- Prognosis

The research question

- PICO
  - Patient
  - Intervention
  - Comparison
  - Outcome

- Among _(*patient description*)_, is ___(*intervention*)__ more effective than __(*comparison*)__ at ___(*outcome*)?

Small group session 1

- Develop a research question at your table

Large group

A few groups share their research questions

02

Define a study population and sampling strategy

Study population

- Defined by the inclusion and exclusion criteria

- To whom do you have access? (practical considerations)
  - Your immediate colleagues
  - The health system of which you are a part
  - Region? statewide? National group?

- Are there existing data?

- Start with a pilot?

Sampling strategy

- How will you select study subjects?
  - Random sampling

  - Convenience sampling

Small group session 2

- Decide on your inclusion and exclusion criteria and how you will select your sample

Large group

1 or 2 groups

- Restate your research question for the large group

- Discuss inclusion and exclusion criteria

03

Operationalize the variables

Study design

- Quantitative
  - Numerical data, closed-ended responses
  - Observational or experimental

- Qualitative
  - Non-numeric data
  - Open-ended questions
  - Focus groups, grounded theory, phenomenology, ethnography

Study design

- Observational
  - Cohort – groups identified by independent variable
  - Case control – groups identified by outcome
  - Cross sectional – one data collection point for all variables

- Experimental
  - Randomized controlled trial – subjects **randomly assigned** to study groups

Identify your variables

- What are they?
    - Independent variable of interest
    - Dependent variable (outcome)
    - Potential confounders

Types of data

- Continuous
  - Evenly spaced, has units
  - Example – height, weight, TSH

- Ordinal
  - Categorical with an inherent order to the categories
  - Not evenly spaced
  - Example – cancer stages, Likert scale scores

- Nominal
  - Categorical with no inherent order
  - Examples – eye color, race, religion

Review

- **Research Question:** Is there a higher incidence of burnout in PAs that work four 10-hour shifts per week or those who work three 12-hour shifts per week?

  - What is the dependent variable?

  - As stated, is the dependent variable categorical or continuous?

  - What is the independent variable?

  - What are potential confounding variables?

Small group session 3

In your small group, discuss:

- the best study design for your question

- your variables

Data collection

- Survey

  - Previously validated instrument?

- Existing data from a database (AAPA, PAEA, NCCPA, etc.)

  - How was the outcome measured?

Operationalizing variables

How will you define and measure your variables?

Null hypothesis	Variables	Operationalization
Burnout scores are equal for those who work five 8-hour shifts per week and those who work three 12-hour shifts per week	Shift Burnout score	0 = 8-hour, 1 = 12-hour Scored from 0 (low) to 100 (high)
Burnout scores are equal for those who work five 8-hour shifts per week and those who work three 12-hour shifts per week, while controlling for specialty, pre-existing mental health diagnoses, safe-haven reporting option	Specialty Pre-existing dxs Safe-haven reporting	1 = primary care, 2 = surgery, 3 = ED, 4 = psychiatry, 5 = other 0 = none, 1 = depression, 2 = anxiety, 3 = psychoses, 4 = other 0 = no, 1 = yes

Small group session 4

In your small group, plan your:

- Data collection

- Definition of variables

- Operationalization of variables

04

Develop a statistical analysis plan

Statistical plan

Null hypothesis	IVs	DV	Covariates	Statistical test
Burnout scores are equal for those who work five 8-hour shifts per week and those who work three 12-hour shifts per week	Shift	Burnout score	---	Student t test
Burnout scores are equal for those who work five 8-hour shifts per week and those who work three 12-hour shifts per week, while controlling for specialty, pre-existing mental health diagnoses, safe-haven reporting option	Shift	Burnout score	Specialty Pre-existing dxs Safe-haven reporting	ANCOVA

Small group session 5

In your small group, develop a statistical plan

Return to large group...

Share your plan

Session wrap-up

"Research is seeing what everybody else has seen and thinking what nobody else has thought."

–Albert Szent-Gyorgi

Thanks