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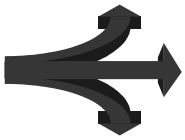


Theory
Hypotheses
Variables
Quantitative Research Design

Goals

- Critique theories/conceptual frameworks in research studies
- Differentiate between research problem statement, purpose, question, hypothesis
- Formulate testable hypotheses
- Identify independent/dependent variables
- Understand appropriate uses of various quantitative research designs

First, the theoretical context

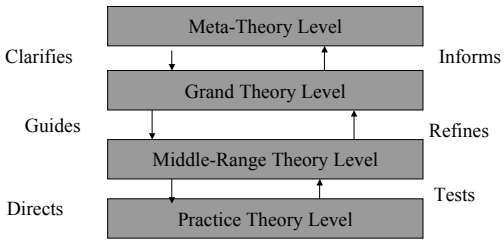
"A theory is a way of making sense of a disturbing situation so as to allow us to most effectively bring to bear our repertoire of habits, and even more important, to modify habits or discard them altogether, replacing them by new ones as the situation demands…..

To engage in theorizing means not just to learn by experience but to take thought about what is there to be learned….lower animals…learn *by* experience, but not *from* it, for *from* learning requires symbolic constructions which can provide vicarious experience never actually undergone." Kaplan

THEORIES are

- Viewpoints or ways of perceiving
- Principles to explain, predict, and control phenomena
- Not discovered; they are created and invented
- Perspectives on truth and reality

The Theory of Theories



Meta-Theory

- The philosophical and methodological questions about nursing theory
  - Empirical positivist
  - Natural inquiry
  - Both?

Grand Nursing Theory

- Abstract and give broad perspective to the goals and structure of nursing practice
- Heavy writings in 70-80s
- i.e., Roy, Newman, Johnson…
- Similarities in Nursing Theorists
  - Person
  - Environment
  - Health
  - Nursing

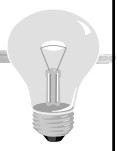
Middle Range Theories

- Substantive theory that tends to cluster around a specific phenomena.
- Relationships of concepts articulated

Research Waterfall (Fawcett)

- Theory
  - Concepts defined
  - Relationships hypothesized
- Operational Definitions
- Variables
  - The measurement

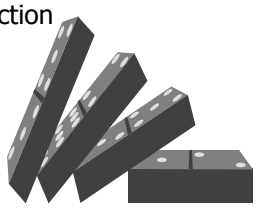
Conceptual or Theoretical Framework



A brief explanation of a theory or those portions of a theory to be tested in a study

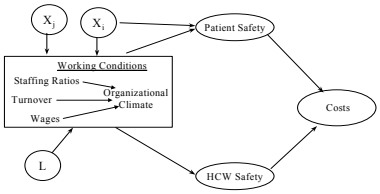
Conceptual Frameworks Common in Nursing

- Health Locus of Control
- Theory of Reasoned Action
- Health Belief Model
- Coping (Lazarus)
- Hardiness
- Stress (Selye)



Conceptual Models/Frameworks

Figure 1. Conceptual Framework of Outcomes of ICU Working Conditions



X_i =Patient Characteristics, X_j =Setting Characteristics, L=Nurse Labor Market

Critiquing the Framework

- Is there one, and is it explicit?
- Does the framework describe concepts of interest?
- Does it present relationships among concepts and relate them to study variables?
- Is there logical consistency between framework, variables, design, discussion?

Hypotheses and Variables

Each Step Narrows The Focus:

- Problem
- Purpose
- Hypothesis

Research Problem

"Current hospital policy requires use of routine heparin lock flushing. There is disagreement on whether heparin flushes are necessary to maintain patency. Heparin is incompatible with many drugs. The interaction potential of heparin may be avoided by flushing the lock with normal saline injection before and after medication administration. Saline flush is safe, saves time and is less costly."

Research Purpose

The purpose of this study was to evaluate effectiveness of normal saline versus normal saline containing 10 U/ml of heparin for maintaining heparin-lock sites.

What Is An Hypothesis?

A formal statement of the expected relationships among variables

Hypothesis

There is no difference in patency of heparin locks flushed with normal saline or with normal saline containing heparin.

(Null)

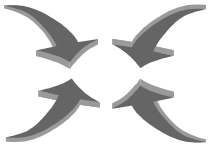
Hypothesis

Heparin locks flushed with normal saline will maintain their patency longer than heparin locks flushed with normal saline and heparin.

(Directional)

An Hypothesis Must

- Predict a relationship between two or more variables
- Be testable
- Be justifiable (based on rationale/theory)



Types of Hypotheses

Causal vs Associative

- Causal
  - Dieting women participating in a formal exercise regimen will have greater weight loss than dieting women without an exercise program
- Associative
  - There is a positive relationship between amount of exercise and weight loss among dieting women

Types of Hypotheses

Simple (two variables) vs. Complex (>2)

- Infants born to heroin-addicted mothers have lower birthweight than infants of non-addicted mothers
- Infants born to heroin-addicted mothers have lower birthweight, more neurologic complications, and higher mortality than infants of non-addicted mothers

Types of Hypotheses

Nondirectional vs Directional

- Incidence of decubitus ulcers is related to the frequency of turning patients.
- Patients turned at least every two hours have a lower incidence of decubitus ulcers than patients turned less frequently.

Types of Hypotheses

Null vs. Research

- There is no relationship between gender and knowledge of sexually transmitted diseases among teenagers
- Teenage boys are better informed about STDs than teenage girls

A Research Hypothesis Should

- Be written in the present tense
- Not include statistical jargon (e.g., "statistically significant", "controls")
- Allude to the target population to which the knowledge would apply
- Be simple and concise

Same Study: Different Wording

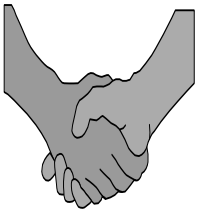
- Theory posited Directional relationship between variables.

Patients who receive reconditioning have less bladder dysfunction after removal of indwelling catheters than patients who receive no conditioning

Same Study, Different Wording

Nondirectional, Research

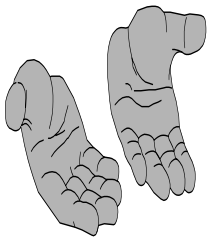
There is a difference in bladder function after removal of indwelling catheters among patients with and without reconditioning



Same Study, Different Wording

Statistical, Null

There is no difference in bladder function after removal of indwelling catheters between patients who had received reconditioning and those who had not.



Critiquing Research Questions/Hypotheses

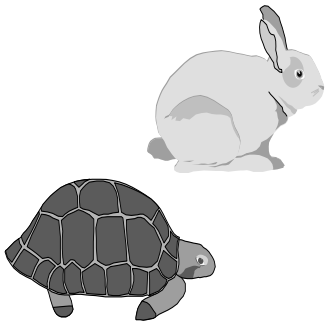
- Are they formally stated?
- Do they clearly emanate from the problem and purpose?
- Are they linked to the study's framework?
- Are they testable in this study?

Levels of Abstraction

- CONSTRUCT: Emotional responses
- CONCEPT: Anxiety
- VARIABLE: Palmar sweating

What Are Variables?

Qualities or characteristics that vary between individuals, things, or situations



Variables

- Independent
  - Cause
  - Action
  - Intervention
- Dependent
  - Effect, outcome
  - Reaction
  - Response

Same Variable Can Be Independent or Dependent depending on the research design and question

- Influence of a nurse's experience with death and dying on nurse's degree of religious activity
- IV=Death experience
- DV=Religious activity

- Influence of a nurse's degree of religious activity on attitude toward death and dying
- IV=Religious activity
- DV=Death experience

It Takes All Kinds

- Research variables (which could be independent or dependent or neither) are those being studied
- Demographic variables describe the population (and may be confounding variables)
- Extraneous (confounding) variables influence relationships being studied

How Is It Measured?

- Conceptual definition: the abstract meaning of a variable that is usually based on theory
- Operational definition: a way of defining the variable to make it measurable

For Example…

COPING BEHAVIOR

- Conceptual: Actions directed toward managing internal and environmetnal demands that exceed a person's resources
- Operational: Measured by the Ways of Coping Checklist, a 68-item scale

Ways to Define OBESITY:

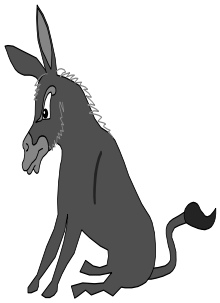
- 20% above national recommended weight for height
- Body mass index >25
- Positive response to question: "I feel fat"
- Positive response to question: "Do others think that you are overweight?"

Operational Definitions For…

- Fatigue?
- Psychological adaptation?
- Pain?
- Happiness?
- Urinary tract infection?
- Wound healing?

Critiquing Study Variables

- Are they clearly identified?
- Are operational definitions clear?
- Are extraneous variables identified, controlled and/or discussed



BREAK