NRSG 386

Lesson 3 Overview of Research Process: Quantitative and Qualitative Research

Major Components of Research Articles
- Abstract (Do NOT use for appraisals)
- Introduction: problem and purpose, literature review, conceptual or theoretical framework
- Methods: sample, measures, procedures for data collection, data analysis
- Results (the data)
- Discussion, conclusions, implications for further research and practice

Interrelationships

Human Subjects Review
- Purpose: protect human subjects throughout research process (there also is a review board for animal research)
- Done initially to approve study before any data can be collected
- IRB: (Institutional Review Board) reviews protocols and makes suggestions/approves consent forms before study can begin

Informed Consent
- All research subjects must be informed of their rights as research subjects as well as the risks & benefits of the study prior to signing the consent form.
- Parental consent is needed for children <19 years of age (state of Nebraska).
- Legal guardian must consent for vulnerable adults.

Quantitative Research
Study Purpose, Question, Aims, Hypotheses

- From practical experience,
- Scientific literature,
- Gaps in the literature,
- Interest in untested theory.

To find the study purpose, look close to the beginning of the article or in the abstract. If you quote it exactly in the appraisal, use quotation marks and include page number!

Problem vs Purpose
(Why is this topic important? vs What is the researcher doing?)

- Problem identification establishes importance of the research
  - Identifies how the research can benefit patients, nurses, society
  - Determines applicability to education, practice, further research
  - This is critical if researcher hopes to engage interest of readers or find funding to support the study!

Hypothesis/Purpose Statement

- Identifies the variables (dependent, independent)
  - Dependent: variables NOT being manipulated; study outcomes
  - Independent: variables being manipulated; the intervention being tested
- Specifies the population being studied
- Developed from the problem/purpose
- Hypothesis is an assumptive statement about the relationship between two or more variables that suggests an answer to the research problem.
- Research question generally found in exploratory or qualitative research (not hypothesis)

Examples

- **Specific Aim**: the aim of this study is to determine if children prepared for surgery by a child life specialist exhibited less anxiety than those who were not prepared.
- **Hypothesis**: children prepared for surgery by a child life specialist will exhibit less anxiety postoperatively than children not prepared for surgery.
- **Research Question**: will children prepared for surgery by a child life specialist exhibit less anxiety than those not prepared for surgery?

Literature Review

- Summary of literature pertinent to topic
- Search most recent literature, usually
- Literature review section can usually be found after the introductory paragraphs or may be incorporated into the introduction of the article.

Types of Literature

- **Primary source**: This is what you want!
  - Original research or theory
- **Secondary source**: NOT what you want!
  - Synthesis or summary of others' work (review article or critique);
  - Textbook;
  - "How to" article about an aspect of nursing practice
  - Use the reference list to locate primary sources
How to Determine if Article is Primary or Secondary

- In the body of the article, look at how the author refers to the citation (e.g. “research by Smith and Jones (2007) showed that..”)
- In the reference list, look at the article title for clues (e.g. “A randomized controlled trial of the effectiveness of ASA in preventing MI”)
- Type of journal in which the article is published. Is the journal peer reviewed? Does it publish mostly research or practice articles?

Theoretical Framework

- Theory: a set of interrelated statements that describes, explains, or predicts phenomena in a systematic way.
- Theoretical framework includes interrelated concepts, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting phenomena
- E.g. Piaget’s theory of development

Conceptual Framework

- A structure of concepts (variables) or theories pulled together to provide a framework for a particular study
- Often (but not always) represented by a graphic figure in published article
- E.g. Response to Stress Conceptual Framework

Break Time!

Design (more in Lesson 4)

- Purpose of study determines design
- Participants (who)
- Intervention (what)
- Selection of setting (where)
- Measurements or observations (when? how many?)
Types of Designs

- Experimental
  - Controls, control group
  - Independent variable "manipulated"
  - Subjects randomized (to groups, usually e.g. RCT (Randomized, controlled trial))
- Quasi-experimental
- Non-experimental (e.g. survey, correlational)

Sample

- Who participated in the study?
- How were they recruited to participate?
- How were they divided into groups (experimental/control)?
- Types of sampling
  - Probability vs non-probability

Internal Validity

- Internal validity: independent variable really caused or resulted in change in dependent variable
  - History
  - Selection
  - Maturation
  - Testing
  - Mortality
  - Instrumentation
    - Inter-rater reliability for observations

External Validity

To what extent can these results be generalized beyond the sample studied?
- Population; target population; accessible population, sample...
- Effect of selection
- Reactive effects
- Interactions between treatment, selection, setting

Levels of Measurement (data)

- Nominal: categorization of objects
  - E.g. marital status, gender
- Ordinal: hierarchical ranking (order)
  - E.g. education level, social status
- Interval: equal distance between ranks
  - E.g. temperature, Likert scales (anxiety, depression)
- Ratio: Absolute zero plus equal interval
  - E.g. your bank account, weight, heart rate

Data Collection Methods

- Available data – retrospective (e.g. medical record)
- Observational methods (need to assess inter-rater reliability)
- Interviews
- Questionnaires (referred to as instruments or tools)
**Measurement (Instruments)**

- **Reliability:**
  - Consistency, stability, equivalence of measurement instruments
  - Types: Alternate forms, Test-retest, Interrater, Cronbach’s alpha, Split-half

- **Validity:**
  - Accuracy of measurement
  - Types: content/face, construct, concurrent, predictive, convergent or concurrent, divergent or discriminant, contrasted groups, Factor analysis

- Reliability does NOT equal validity; Reliability is necessary to establish validity

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**Data Analysis**

- Purpose is to provide researcher with answers to the research questions or test hypotheses

- **Statistical tests:** e.g. t-test, ANOVA, r

- Many data analysis programs exist: SAS, SPSS, NUDIST, ATLASTi, etc.
  - These are NOT the statistical “tests;” these are the programs that run them.

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**Results/Findings**

- **Answers to the research questions or hypotheses** (statistically significant and/or clinically significant results)

- Written in narrative form, supplemented with tables & figures (graphs); these should be clear and help explain the findings

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**Discussion**

- Conclusions/generalizations based on the results

- Comparison to previous literature
  - Results of this study similar or different from previous studies?

- **Limitations**
  - What could have influenced the findings other than the independent variable?

- Implications for practice & further research

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**Qualitative Research**

- “And now for something completely different….”
  - Monty Python

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**Break time, again!**
General Information

- Inductive design from particular to general
  - (Quantitative research is DEDUCTIVE, Qualitative/interpretive research is INDUCTIVE)
- Variety of approaches
- Unique focus and research inquiry
- Useful when not much is known about a particular area of inquiry

Advantages

- Focus is on the MEANING of a phenomenon or experience
- Basis of qualitative/interpretive research is on social interaction between people or their perceptions of life events
- Natural settings used for observations
- Data analysis uses words, not numbers

Disadvantages

- Results of one study most likely should not be generalized beyond subjects in the study
- Can not be used to determine causality

Types of Qualitative Designs

- Case study (Psychology)
- Phenomenology (Philosophy)
- Grounded Theory (Sociology)
- Ethnography (Anthropology)
- Historical research

Data Collection Methods

- Focus groups
- In-depth interviews
- Focused observations of behavior (must establish inter-rater reliability)

Results

- Themes, categories, or theory identified:
  - E.g. “Four themes emerged from this study…”
  - “Nine distinct categories were derived from the interviews…”
  - “In this grounded theory study, the basic social psychological problem that occurs for a mother when her infant cries persistently was the loss of her baby and sense of competence as a mother.”
Appraising Quality of Study

- Determine study’s:
  - Credibility
  - Transferability
  - Dependability
  - Confirmability

Qualitative Studies & Clinical Practice

- Examples of studies:
  - What is the experience of having an ill child in intensive care (Phenomenological)
  - This study was designed to determine cultural patterns among Native Americans in Utah (Anthropological)
  - The purpose is to describe the experience and perceptions of mothers whose infants cry persistently (Grounded Theory)

Dissemination of Findings

- Published research (peer-reviewed journal)
- Presentations at professional meetings or within one’s organization
- Important step of process that is most neglected due to time constraints and fear of rejection