Basic Steps in Planning Research

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Research Levels

- Level 1: There is little or no literature available on the topic or on the population. The purpose is to describe what is found as it exists naturally.
- Level 2: There is knowledge about the topic and the population but the intent of the research is to do a statistical description of the relationship among the variables.
- Level 3: There is a great deal of knowledge and theory about the topic and the purpose of the study is to test the theory through direct manipulation of the variables.
Question

- Level 1: What is or what are
- Level 2: What is or what are the relationships between or among variables
- Level 3: Why
Problem

- Level 1: Little or no literature on the topic
- Level 2: Conceptual or theoretical base
- Level 3: Theoretical base
Purpose

- Level 1: Declarative statement
- Level 2: Question or Hypothesis
- Level 3: Hypothesis
Design Level

- Level 1: Exploratory-descriptive
- Level 2: Descriptive survey
- Level 3: Experimental
Design

- Level 1: Exploratory or Descriptive
- Level 2: Correlational or Comparative
- Level 3: Quasi-experimental or Experimental
Sample

- Level 1: **Exploratory**: Small sample or total population
  - **Descriptive**: Total population or sample
- Level 2: **Correlational**: Probability as large as possible
  - **Comparative**: Nonrandom assignment
- Level 3: **Quasi-experimental**: Nonrandom assignment
  - **Experimental**: Random assignment
Methods

- Level 1: **Exploratory**: qualitative & unstructured data
  
  **Descriptive**: mixed methods: qualitative, quantitative, structure, unstructured data
Methods

- Level 2: Correlational/comparative: Structured or quantitative data collection
- Level 3: Quasi-experimental/experimental: Structured or quantitative data
Analysis

- Level 1: **Exploratory**: Content analysis and constant comparison
  
  **Descriptive**: Descriptive statistics, content analysis, charts and graphs
## Descriptive Statistics

<table>
<thead>
<tr>
<th>Measures of Central Tendency</th>
<th>Nominal Qualitative</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinal</td>
<td>Median</td>
<td></td>
</tr>
<tr>
<td>Scale of ↑ magnitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interval/ratio</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Quantitative numerical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measures of variation</td>
<td>Nominal</td>
<td># of categories</td>
</tr>
<tr>
<td>Ordinal</td>
<td>Range</td>
<td></td>
</tr>
<tr>
<td>Interval/ratio</td>
<td><strong>Standard deviation</strong></td>
<td></td>
</tr>
<tr>
<td>Tests of relationships</td>
<td>Nominal</td>
<td>Chi square</td>
</tr>
<tr>
<td>Ordinal</td>
<td>Spearman rank</td>
<td></td>
</tr>
<tr>
<td>Interval/ratio</td>
<td>Pearson r</td>
<td></td>
</tr>
</tbody>
</table>
Analysis

- Level 2: Correlational: Correlational analysis or tests of association

  Comparative: Differences between group means

- Level 3: Quasi-experiment/experimental: Differences between sets of scores
Appropriate statistical tests

- **Difference between 2 groups**
  - T test –parametric (interval/ratio scales)
  - Fisher exact test (nominal data)
  - Mann-Whitney-U (ordinal data)

- **Differences for same group before and after**
  - T test parametric (interval/ratio scales)
  - McNemar Chi Square (nominal data)
  - Sign test/Wilcoxin (ordinal data)
Appropriate statistical tests

- **Differences in multiple groups**
  - One-way analysis of variance [ANOVA] (parametric)
  - Chi-square test (nominal data)
  - Kruskal-Wallis one-way analysis of variance (ordinal)(<15 subjects/group))

- **Correlations between variables**
  - Pearson r (parametric)
  - Chi-square (nominal data)
  - Spearman rank correlation (ordinal data)
Answer

- Level 1: **Exploratory**: Description of processes or concepts or phenomena
  
  **Descriptive**: Description of variables or populations
Answer

- Level 2: **Correlational**: Explanation of relationship among variables
  
  **Comparative**: Support or reject hypothesis/theory

- Level 3: **Quasi-experimental/ Experimental**: Test theory
The End

- Proceed to the post test
- Print the post test
- Complete the post test
- Return the post test to Dr. S.K. Oliver
  407i TAMU11
1. Match the following

- Level 1
- Level 2
- Level 3

- 1. What are the eating problems of children
- 2. Why does increased vitamin C in the diet decrease skin fragility in elderly
- 3. What is the relationship between relaxation and pain in postoperative patients?
2 Match the following

- Analysis of open ended questions of bereaved
- Student USMLE scores before and after curriculum change
- Frequency of selecting a private MD, VAMC or HMO by subjects from 5 ethnic groups (<15 subjects/group).

- 1. Mode
- 2. Kruskal-Wallis
- 3. T Test
bibliography