Module 4
Data analysis
What do your results tell you?

Kentucky Appalachian Rural Rehabilitation Network

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Learning Objectives

By the end of this module the Student will be able to:

1. Compare and contrast qualitative versus quantitative analysis.
2. Describe descriptive analysis.
3. Describe the basics of statistical analysis.
4. Describe possible next steps following the data analysis.

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The Research Process

Step 4: Data Analysis (Results) – How do you determine what your data actually means?

- Descriptive analysis
- Statistical Analysis
- Can work with another researcher or other resource (statistician) who can help you with this.
- Qualitative analysis: interview narrative analysis

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Descriptive analysis

- Descriptive statistics summarize data (percentages, means, medians, etc.)
- Aim to summarize a data set, rather than use the data to learn about the population that the data are thought to represent
- Descriptive statistics are generally also presented if any quantitative data is collected
- This is the most basic type of quantitative data analysis

Descriptive analysis Example:

A study involving human subjects, provides a there table describing

- sample size
- demographics
- clinical characteristics (average age, gender, and the proportion of subjects by diagnosis).

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Example of Descriptive Statistics

Tilson, Wu, Cen, Feng, et al. Stroke. 2012; 43, 446-452

Characteristics of Participants by Faller Category at 2 Months Post-stroke*

Item	All Participants (n=408)	Non-fallers (n=173)	Single, Non-injurious fallers (n=88)	Multiple *or* injurious fallers (n=147)
PERSONAL FACTORS				
Demographics				
Male	224 (54.9%)	99 (57.2%)	47 (53.4%)	78 (53.1%)
Female	184 (45.1%)	74 (42.8%)	41 (46.6%)	69 (46.9%)
Age at stroke onset	62.0±12.7	60.8±13.2	60.5±12.9	64.4±11.9
Co-morbidities				
Depression score (PHQ-9)	4.7±5.2	4.4±5.2	4.8±5.5	5.0±5.1
Depression (PHQ-9 ≥10)	67 (16.4%)	28 (16.2%)	13 (14.8%)	26 (17.7%)
Atrial fibrillation	31 (7.6%)	14 (8.1%)	7 (8.0%)	10 (6.8%)
Coronary Artery Disease	56 (13.8%)	20 (11.6%)	13 (14.8%)	23 (15.8%)

Descriptive analysis Examples:

- The shooting percentage in basketball is a descriptive statistic that summarizes the performance of a player or a team.
- This number is the number of shots made divided by the number of shots taken.

Statistical Analysis

- **Statistics** is the study of the collection, organization, analysis, and interpretation of data.

- Many times it is very helpful to work with another researcher or other resource (statistician) who can help you with the analysis.

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Statistical Analysis:

Statistical procedures are used to test hypotheses through the calculation of a test statistic (a sample of a population). Different statistics are used to test differences between means, correlations and proportions.

Statistical Analysis example:

The comparison of the average (mean) number of persons with diabetes in rural communities versus urban communities. Since both groups can be very large, we can analyze only a sample from each community and compare them.

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Statistical Analysis:

Correlation refers to the relationship between two variables.

Examples:

- The correlation between the height of parents and their children.
  - If the correlation is 1, or close to 1, this indicates a strong likelihood that the child's height is in direct relation to the parent's height.
- The correlation between the demand for a product and its price.
  - If the correlation is negative (e.g. -1) then it indicates that as price rises, demand falls.

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Statistical Analysis:

Proportions: The ratio of one quantity to another, especially the ratio of a part compared to a whole.

- For example the ratio of persons with diabetes living in particular community compared to the community as a whole.
  - This might be a large proportion (e.g. 25%) or a small proportion (e.g. 1%) depending on many factors.

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Qualitative/Interview narrative analysis

- Qualitative data often comes from interviews, focus groups or observation
- Data is the information (words, pictures, forms, etc.) that comes from those activities
- Data is often in the form of tape recordings, photos and documents
- Tape recordings are typed up into a written format (a transcript)

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Qualitative/Interview narrative analysis

- Content analysis comes from reading the written scripts and analyzing what is being said by each individual.
- The data of each individual is combined to understand in terms of the total group of people who take part in the study.
- Data is analyzed word by word, then idea by idea, followed by category by category.

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Qualitative/Interview narrative analysis

- Eventually the data can end up with the development of a model or a theory and the information can be transferred to other people and groups
- The goal is to understand “why” something has happened or people think or act a certain way

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Example: What do people with SCI living in rural Kentucky need to improve their quality of life?

- Interview qualitative/narrative analysis
- Identify common themes among multiple interviews
  - The need for accessible rural environments
  - Activity levels after acute rehab
  - Support from others with similar experiences
  - Knowledge base of health care providers in the area of spinal cord injury

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Interpreting Your Results

- Does your data answer your question, does it prove or disprove your hypothesis?
  - **If yes**, great. What will your next step be?
    - Will your results lead to a change in healthcare practice?
    - Will you make changes within your community?
    - Will you need to ask another question (create another study)?
    - Will you publish your results (see module 5)?

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Interpreting Your Results

- Does your data answer your question, does it prove or disprove your hypothesis?
  - **<u>If no</u>**, what are the possible reasons?
    - Do you rethink your question?
    - Do you need to conduct additional research?

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Short Research Module Survey

Please follow the link to a short survey that will give us feedback about the training module you just finished. Your answers are completely confidential and we will not contact you for any additional information. Your feedback is important to us and will allow us to modify this module as needed.

https://docs.google.com/spreadsheet/viewform?formkey=dHhKODVLMzM5VE9vaEJGMGZ0ZzJXX1E6MQ

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