Research &  Scientific Method

Outline

Intro

Study Design

Observational/Epidemiological

Experimental

Evaluation of a study

Reading and interpreting a study

Nutrition: A very young science!

Scientific method is the process of gaining knowledge about the universe through the observation of measurable evidence

Problems:

Media

New & conflicting studies reported daily

Often not put into perspective

Rely on evidence-guided recommendations

Research types providing valid information

Epidemiological research (Observational research)

Study large populations to find relationships between two variables

Retrospective techniques

Compare those with a disease to a similar group (cohort) without the disease

Prospective techniques

Individuals without disease are studied for years and then conclusions are made to identify why some developed disease and others did not

Epidemiological research

Helps scientists identify important relationships between diet and health

1950s research – Dietary fat

Does not determine cause and effect relationship

Light posts and heart attacks

Experimental research

Essential to establishing a cause and effect relationship

TREATMENT

Tighter control

Shorter time-frame

Independent variable – cause (Diet)

Dependent variable – effect (Heart disease)

Often utilizing;

Randomized selection and assignment

Treatment and control groups

Placebo

Single/double blind

Experimental research

Populations

Random sub-group of a population

Size matters

People v. animals

Healthy v. sick

Exercising v. not exercising

Gold Standard?

Elements of great methodology

Methodological considerations for studies:

Logical rationale

Appropriate subjects

Valid performance tests

Placebo control

Random assignment of subjects

Crossover

Double-blind protocol

Control of extraneous factors

Appropriate data analysis (statistics)

\*\*\*Statistical vs. Clinical significance (real world application)\*\*\*

p value

Peer-reviewed

Reading a Study

**Abstract** = summary

**Introduction** =

Gives background: Why?

States purpose

**Methods** = how study was conducted

Who - subjects

Where - lab, clinic, field

What/How - Tx

Data analysis

**Results** = what was found

Statistical significance, p value (p < 0.05)

Clinical significance/real world application

**Conclusion** = what the results indicate

**Discussion** = insight, application, strengths & weaknesses, propose future research

**References**

How to locate **original peer-reviewed** research

Pubmed

Journals - see syllabus for list

MLK Library

http://www.sjsu.edu