Nutrition Research: Overview

Understanding Studies In the News
- Secondary & primary sources
- Explore how scientific news is conveyed to you

Scientific Method
- How scientists gain scientific knowledge
- Types of Study Designs used to gain knowledge
  - Observational Study
  - Experimental Study

One Study Doesn’t Prove a Finding
Sources of Scientific News

**Secondary sources of information**
- Resource that informs us of scientific research
- Scientific news from websites, social media, TV, newspapers (New York Times), radio, magazines

**Primary Source:**
- Original Research
- Best research is published in scientific (peer-reviewed) journals

As scientific studies gets interpreted by others, less detail is provided and more opinion and sensationalism is added.
Journalists who interpret findings from scientific studies....some qualified but most not qualified

Important to know if the information you receive is accurate.
News Headline: Lack of Vitamin D Makes Kids Fat

Researchers conducted a study at U of M (published in Journal of Clinical Nutrition) followed 479 youngsters over 30 months.

“We found that the kids with the lowest Vitamin D levels...tended to gain weight faster than the kids with higher levels.”

“Our findings suggest that low vitamin D status may put children at risk of obesity.”

www.naturalnews.com
Scientific Method

Process all scientists follow to gain scientific knowledge when conducting research.

There are 7 steps in the scientific method.
Scientific Method:

1. Question or observation
2. Purpose of study or hypothesis (a testable statement)
3. Design the study:
   ✓ Develop a plan to test the hypothesis
   ✓ Choose design type: observational or experimental
4. Implement the study
5. Collect & analyze data
6. Interpret results
7. State results or accept/reject hypothesis
3. Design the Study

Determine if finding correlation or cause/effect

- **Correlation** (Association): A connection that exists when one condition accompanies another condition.

- **Cause and Effect**: A connection that exists when one condition produces another condition.

Studies designed to test for correlation do NOT prove cause & effect.

2 Main Types of Study Designs

- Observational
  - **Correlation** (Association)

- Experimental
  - **Cause & Effect**
Scientists do not ask people to change their behaviors or undergo any treatment.

Follow people with different behaviors and observe effects on health.

Data collected by recording observations

Minimal risk to participants
Observational Study

- Group of interest (e.g. smokers)
  - Follow over time
- Comparison group (e.g. non-smokers)
  - Follow over time

Compare outcomes
Observational Study

Risk Factor: Conditions that increase the likelihood that a particular disease or condition will develop.

Framingham Study

An observational study; began in 1948 to determine relationship between diet, lifestyle and heart disease.

Observational Studies may suggest correlation
Experimental Study

Researchers intervene
- Participants in “treatment” or “control” group (no treatment)
- May suggest cause & effect

Random assignment
- Participants have equal chance to be in treatment or control group
- Factors that may affect the outcome are distributed equally among the two groups

If significant difference found between treatment & control group treatment caused the effect
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Ice Cream & Drowning

Studies have shown people are more likely to drown in places where ice cream sales are high.

The higher the ice cream sales...the more likely people are going to drown.
Does ice cream make you drown...cause drowning?

If you eat ice cream, are you REALLY more likely to drown?

What is the association between ice cream & drowning?... what do they have in common?
Water associated with drowning, not ice cream

Ice cream sales tend to be high near water (pools, lakes, oceans) – people more likely to drown near water.

The association (correlation) is between water and drowning.
Just because an OBSERVATIONAL STUDY shows a link between 2 things (ice cream and drowning) does not mean that one is because of the other.

An OBSERVATIONAL FINDING is not a cause and effect finding
Correlations (Associations)

Ice Cream & Drowning
- Studies have shown there is a correlation (association) between high ice cream sales and drowning.
- Ice cream may or may not be associated with drowning (it isn’t).

Vitamin D & Weight
- Research found there is a correlation (association) between kids with low Vitamin D and weight gain.
- Vitamin D may OR may not be associated with weight gain (more studies needed).
Scientific Steps:

1. Question or Observation
2. Purpose or Hypothesis (testable statement)
3. Design:
   ✓ Develop a plan to test the hypothesis
   ✓ 2 main types: observational & experimental
4. Implement the research design
5. Collect & analyze data
6. Interpret results
7. State results or accept/reject hypothesis

4. Implement: Data collected on each participant

5. Analyze data to see if the difference between “Group A & Group B” is “statistically significant”
   - Statistically Significance: The difference between groups was a big enough difference to confirm it was “real”... it did not happen by chance.

6. Interpret: What new knowledge was gained by this research?
Scientific Step 7. State results & accept/reject hypothesis

If the difference was “statistically significant”, then results show a correlation or cause & effect.

Study findings reviewed by board of scientists. If conclusions are accurate, results are published in a peer-reviewed scientific journal.

One study doesn’t prove a “fact”. Findings need to be repeated in several kinds of studies, by different researchers.

Remember: news media reports scientific findings before confirmed by other research.
## Observational vs Experimental

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<thead>
<tr>
<th>Type of study</th>
<th>Ethical?</th>
<th>Results</th>
<th>Random Assign?</th>
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<tbody>
<tr>
<td>Observational</td>
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<td>Experimental</td>
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1943 - Semi-Starvation Study

STEP 1: Observation
People are starving in Europe during WWII

STEP 2: Purpose of Study
- Gain insight into the physical & psychological effects of starvation
- Determine how to rehabilitate people who are starving during WWII in Europe.

STEP 3: Design the study
- It is 1943 and there is no ethics committee
- The study can last no longer than 1 year.
- What kind of study design would you use - Observational or Experimental? WHY?
- Where would you find participants?

BRAINSTORM