What are the types of Research studies?

Objectives

* To describe types of research studies

* To be able to choose the appropriate study design for a specific research question

Assistant Professor Ahmed Muhei Rasheed
FICMS-Otolaryngology

Different types of studies refer to various methods for obtaining data. How researchers collect information and what information they collect depends on their goals and the questions they're trying to answer.

1- Observational

2- Expermental

Types of studies

The two main categories of studies are observational and experimental. Observational studies involve collecting and reviewing data in a non-invasive way. Experimental studies vary widely but always involve the researchers designing a study with controlled variables and interventions.

Within these two types of studies, there are several other sub-types. Researchers pick the correct study type for what information they have and what they're aiming to accomplish.

Common types of studies

1. Meta-analysis

* It's an observational study in which the researchers don't manipulate variables.
* A meta-analysis study helps researchers compile the quantitative data available from previous studies.
* Instead, they observe and analyze the data using statistical methods. For example, researchers may look at all the studies involving smoking cessation and longevity.

* For instance, one study may link smoking cessation to increased longevity but may not have a statistically meaningful sample size. A meta-analysis study may discover 150 similar studies with similar outcomes, making the relationship between smoking cessation and increased longevity more probable.

* The main advantage of meta-analysis is that it's comprehensive, reporting all relevant findings for a specified research question. This is useful for making hypotheses based on previous outcomes.

* The disadvantage of meta-analysis is that it doesn't provide new information. Rather, it presents a thorough compilation of previous evidence.

* Systematic reviews are similar to meta-analysis studies in their techniques.
* For example, a systematic review may examine all the studies on businesses implementing a four-day workweek. Researchers locate all the studies related to shortened workweeks and summarize the studies and their findings.
* Like meta-analysis, the main disadvantage of systematic reviews is that they don't provide new information.

2. Systematic review

* A controlled clinical trial tests the effectiveness of a treatment, device or procedure versus receiving no treatment or a different treatment. A randomized controlled trial is a controlled clinical trial that uses randomization techniques to assign participants to a group.

3. Randomized controlled trial

* Participants receive their group based on certain criteria. Studies may target a certain age range, gender or other diagnoses. Once the researchers choose participants for a randomized controlled trial, the researchers randomly assign them to a group, which may be one of the following:

* The group that receives the treatment, device or procedure being tested
* The group that receives no treatment
* The group that receives a placebo
* The group that receives a different dose or different treatment

* The length of controlled clinical trials varies depending on the nature and purpose of the study. For example, a study testing allergy medication may last a year, while testing a new sleep device may last a month. In each experiment, researchers control the variables related to the outcomes.

Advantages

* They use a highly controlled environment with limited variables affecting outcomes.
* They help determine cause-and-effect relationships.

Disadvantages

* The sample sizes may be small.
* They depend on participant compliance.
* Long-term trials present challenges with maintaining contact with participants.
* They can be expensive.
* Side effects are potentially dangerous.

* Researchers choose groups based on shared features, such as exposure to a chemical, participation in an event or members of a certain group.
* Researchers then monitor the different groups and track their desired metrics, such as incidence of disease or job satisfaction.

4. Cohort study

* For example, researchers interested in the effects of regular exercise on job performance may designate two groups between 25 and 35 years old: one group that exercises at least three days a week and another that exercises less than three days a week.
* Researchers survey the participants every three months about their job performance, promotions and other factors. After two years, researchers compare the job performance outcomes of regular exercisers versus the other group to determine if a correlation between exercise and job performance is present.

Advantages

* Group sizes can be large.
* They provide insights into possible relationships between variables.
* They're less expensive than randomized controlled trials.

Disadvantages

* You cannot randomize them.
* Studies may be lengthy.
* Participants often know which group they're in, meaning the study isn't blind.
* Outcomes may suggest correlative relationships, but causative relationships cannot be determined.

5. Case-control studies*

* Case-control studies analyze people exhibiting a certain outcome, referred to as the cases, with those not exhibiting the outcome, or the controls, to compare the levels of exposure of an agent in each group. Researchers in case-control studies want to determine if an association exists between exposure and a certain outcome.

* For example, environmental scientists may research the incidence of respiratory disease in residents of a town with a chemical plant. In a case-control study, researchers determine how much exposure to the chemicals residents with respiratory disease experience—the cases—compared to residents without respiratory disease—the controls.

Advantages

* They're inexpensive.
* They're quick to conduct.
* They require fewer subjects than other studies.

Disadvantages

* The study is not blind.
* The sample size may be small.
* The results only apply to specific populations and aren't generalizable.

* Cross-sectional studies are designed to determine the incidence of a certain outcome in a specific population at a set time. They often use surveys to gather data from participants. Cross-sectional studies are well suited for measuring the prevalence of a disease

6. Cross-sectional studies

Advantages

* The advantages of cross-sectional studies include:
* They're quick and inexpensive.
* They're safe for participants.

Disadvantages

* They may be subject to researcher or subject bias.
* They cannot determine cause-and-effect relationships.


Thank you
shutterstock.com • 529152574