Research setting and study population

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Outline:

1. Study population
2. Study sample
3. Recruitment

Introduction

- งานวิจัยต้องการตอบคำถามทั่วไปสำหรับประชากรกลุ่มใหญ่ ซึ่งตรงข้ามกันกับการตอบคำถามที่จำเพาะเจาะจงในรายบุคคล
- ดังนั้น นักวิจัยจึงต้องการนำผลการศึกษาจากงานวิจัยไปใช้กับประชากรส่วนรวม ไม่ใช่เฉพาะอาสาสมัครในงานวิจัยของตนเองเท่านั้น

Introduction

Population

- Is the entire set of individuals of interest to a researcher
- although the entire population usually does not participate in a research study, the results from the study are generalized to the entire population

Sample

- a set of individuals selected from a population and usually is intended to represent the population in a research study

Introduction

Target population

- The entire set of individuals who have the characteristics required by the researcher

Accessible population / Study population

- a subset of the target population, consisting of those individuals who are accessible to be recruited as participants in the study

The sample

- a subset of the accessible population, consisting of those individuals who are selected to participate in the research study

Representative samples

- **Representativeness of a sample**
  - is a sample with the same characteristics as the population
- **A biased sample**
  - is a sample with different characteristics from those of the population
- **Selection bias**
  - occurs when participants or subjects are selected in a manner that increases the probability of obtaining a biased sample
  - e.g. a sample from the people in a hospital parking lot is not representative of the adult population

Study population

- Exactly what the population means depends on your research question – the 'P' part of PICO.
- A **study population** is a subset of the general population who share common characteristics e.g. demographics (age, sex, location), health condition (disease duration, severity) or risk factor (smoking, obesity).

Study population

- The study population is defined by a number of criteria that people **must** meet (inclusion criteria) or not meet (exclusion criteria).
- Inclusion and exclusion criteria provide an operational definition of the study population in that everyone who meets the criteria belongs to the population.

A new intervention versus usual care in adults with unilateral knee osteoarthritis (OA)

FOR EXAMPLE, CONSIDER A HYPOTHETICAL STUDY

Inclusion criteria

- Age >18 years (because the target sample is adults)
- OA in one knee (confirmed by x-ray or MRI – to ensure participants have the condition of interest)
- Presenting to general practitioner complaining of knee pain (the study setting, in this case primary care)

Exclusion criteria

- OA in both knees (because the target population is unilateral knee OA)
- History of major psychiatric disorder, or inability to walk 100m without stopping (both excluding some people who may not be compliant with the intervention)

Study population

- Only individuals who meet *all* of the inclusion criteria and *none* of the exclusion criteria belong to the study population, and can therefore be participants in the study.
- Careful consideration of inclusion and exclusion criteria is critical because these not only define who can participate in the study, but also who the final results are applicable to (the generalisability / external validity of the study).

Study population

The way you define your study population depends on the problem you want to investigate and on the objectives of the study.

Generally, the inclusion and exclusion criteria need to identify subjects:

- who will benefit from the research
- in whom the risks are acceptable (will people comply with the study procedures)

Study sample

- Despite the fact that the study population is only a subset of the total population, it is not feasible to study everyone in a study population.

- So researchers include a ‘sample’, which is a group of people all of whom belong to the study population, these are the participants in the study.

Study sample

- The key feature of a sample is that it is 'representative' of the study population.
  - That means that all the important features that appear in the study population, also appear in the sample, and importantly they appear in the same proportion.

- Important features are those that might conceivably impact on the prognosis of people with the condition.

Study sample

- Going back to the hypothetical example above,
  - if 65% of people in the study population defined by the inclusion and exclusion criteria are female, then approximately 65% of the sample should be female
  - if 50% of the study population are over the age of 70, then approximately 50% of the sample should be too

1. Introduction (populations and samples)

Sampling basics

- sampling
  - is the process of selecting individuals for a study
- probability sampling
  - the entire population is known, each individual in the population has a specifiable probability selection and sampling is a random process
- nonprobability sampling
  - the population is not completely known, individual probabilities cannot be known
  - we try to avoid bias and maintain representativeness

2. Probability sampling methods

Simple random sampling

- each individual in the population has an equal and independent chance of being selected
- no individuals are more likely to be chosen than another
- The process of simple random sampling consists of the following steps
  - clearly define the population from which you want to select a sample
  - list all the members of the population
  - using a random process, select individuals from the list
  - e.g. children in a class

2. Probability sampling methods

Systematic sampling

- sample is obtained by selecting every n-th participant for a list containing the total population, after a random start
- after selecting the first individual it is not random
- e.g. every 5th child in a class

2. Probability sampling methods

Stratified random sampling

- used when the focus of a research study is on specific subgroups within a population
- Steps in the process
  - identify the specific subgroups (or strata) to be included in the sample
  - we select equal random samples from each of the pre-identified subgroups
  - we combine the subgroup samples into one overall sample
  - e.g. selecting 25 men and 25 women from an INDV class

2. Probability sampling methods

Proportionate stratified random sampling

- used if researchers try to improve the correspondence between a sample and a population by deliberately structuring the sample so that its composition matches the composition of a population
- e.g. if there are 750 men and 250 women in the INDV population the sample of 100 participants would contain 75 men and 25 women

Cluster sampling

- is used when there are well-defined clusters (groups) within the population
- e.g. selecting students from 10 classes instead of selecting 300 students one at a time

3. Nonprobability sampling methods

Convenience sampling

- the most commonly used sampling method in psychological research
- researchers simply use as participants those individuals who are easy to get (e.g. INDV students or volunteers)
- two strategies to help correct most of the serious problems associated with convenience sampling
  - researchers try to ensure that their samples are reasonably representative and not strongly biased
  - researchers provide a clear description of how the sample was obtained who the participants are in their research studies

Further reading

- Maxine X. Patel, Victor Doku, Lakshika Tennakoon (2003) Challenges in recruitment of research participants. Advances in Psychiatric Treatment 9: 229-238
- http://www.consort-statement.org/resources/glossary/

Thank you