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# Strengthening the Occupational Health Expertise and Scientific Performance of Public Health Institution of Turkey



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## 4.1 Theory on Research

# Learning Objectives

1. How to use the ESPriT repository
2. How to find systematic reviews
3. Know how to assess the usefulness and quality of existing literature
4. Be able to explain the difference between validity and reliability of a study
5. Understand why systematics reviews and peer reviewed articles are important sources
6. Be able to understand and interpret descriptive tables, graphs and statistics



# Answering your questions with available research

How to find relevant literature?

How to assess the quality and the usefulness.



# How to find relevant literature?

The ESPrIT repository on the ESPrIT website.

English language:

<http://repository.esprit-ohs.eu/>

Turkish language:

<http://tr.repository.esprit-ohs.eu/publicationsturkish/publications>



# How to find relevant literature?

1. Know about epidemiology!
2. What do you want to know? (population, disease, type of data)
3. What kind of results are you looking for?
4. Read the summary.
5. Read the method section.
6. Check the tables, charts and graphs for useful information.
7. Assess the quality of the methodology



# How to assess research quality and usefulness?

Critical appraisal:

- Does this study address a clearly focussed question?
- Did the study use valid methods to address this question?
- Are the valid results of this study important?
- Are these valid, important results applicable to my patient or population?



# How to assess research quality and usefulness?

## Validity

Validity refers to the credibility or believability of the research.

- Internal validity = methodological quality
- External validity = generalizability and applicability

## Reliability

Reliability refers to the repeatability of findings. If the study were to be done a second time, would it yield the same results? If so, the data are reliable.



# How to assess research quality and usefulness?

European Statistics Code of Practice requirements:

<http://ec.europa.eu/eurostat/web/quality/european-statistics-code-of-practice>

- Sound methodology
- Appropriate statistical procedures
- Statistical output:
  - Relevant
  - Accurate and reliable
  - Timeliness and punctuality
  - Coherent and comparable
  - Accessibility and clarity



# Pitfalls in (epidemiologic) research

## Random and systematic errors in measurement

Random error is when a value of the sample measurement diverges – due to chance alone.

Systematic error (or bias) occurs in epidemiology when results differ in a systematic manner from the true values.

Random error can never be completely eliminated



# Pitfalls in (epidemiologic) research

## Bias

**Selection bias** occurs when there is a systematic difference between the characteristics of the people selected for a study and the characteristics of those who are not.

## HEALTHY WORKER EFFECT

**Measurement bias** occurs when the individual measurements do not measure correctly what they are supposed to measure.



# Pitfalls in (epidemiologic) research

## Confounding

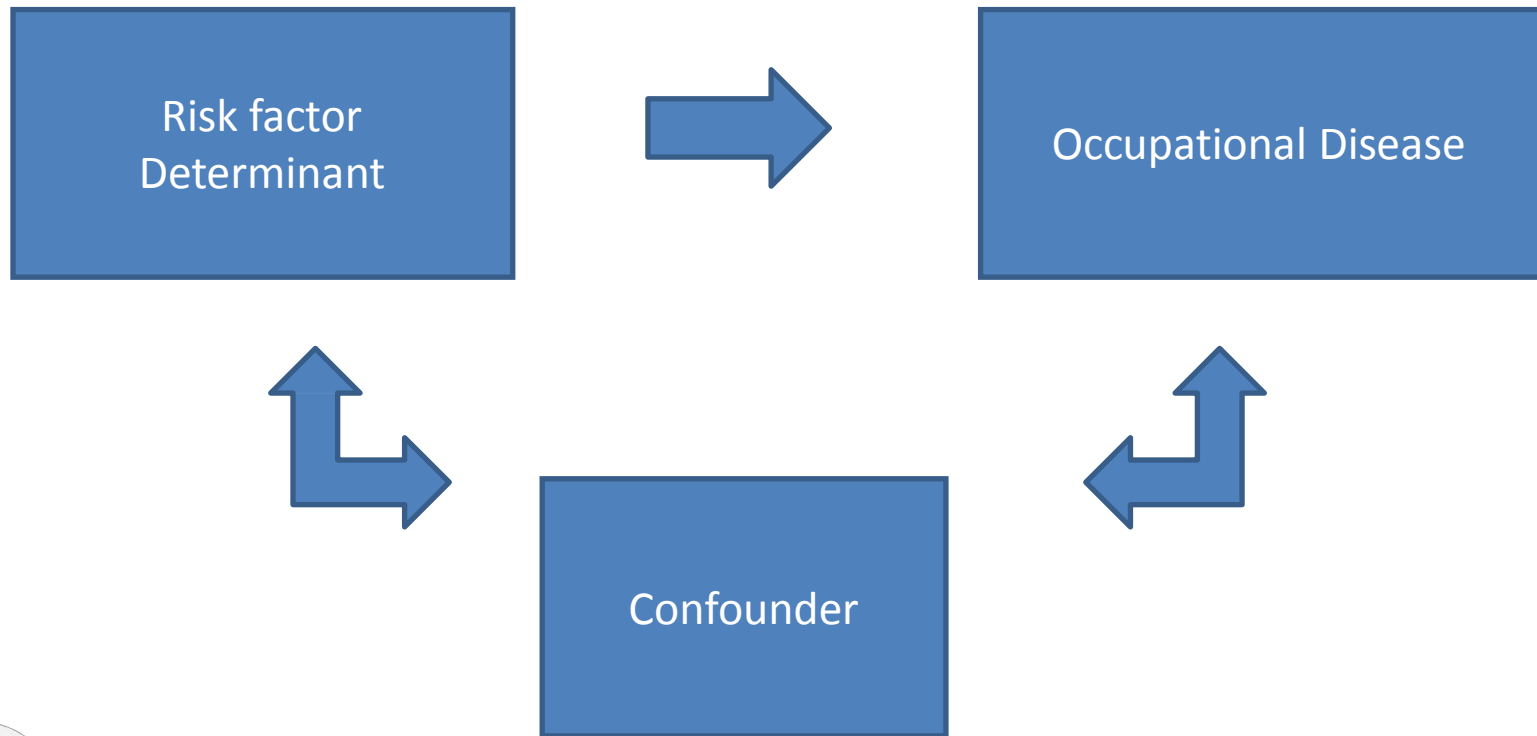
Confounding can occur when characteristics exists in the study population that are associated both with the disease and the exposure being studied.

Most common confounders: Age, Education, Gender



# Pitfalls in (epidemiologic) research

## Confounding



# How to find good research?

## Search in peer reviewed Journals, like:

- Turkish Journal of Occupational / Environmental Medicine and Safety
- Turkish Journal of Public Health
- International Archives of Occupational and Environmental Health
- Safety and Health at Work
- BMC Public Health
- PLOS One
- Occupational and Environmental Medicine
- Environmental Medicine
- Occupational Medicine

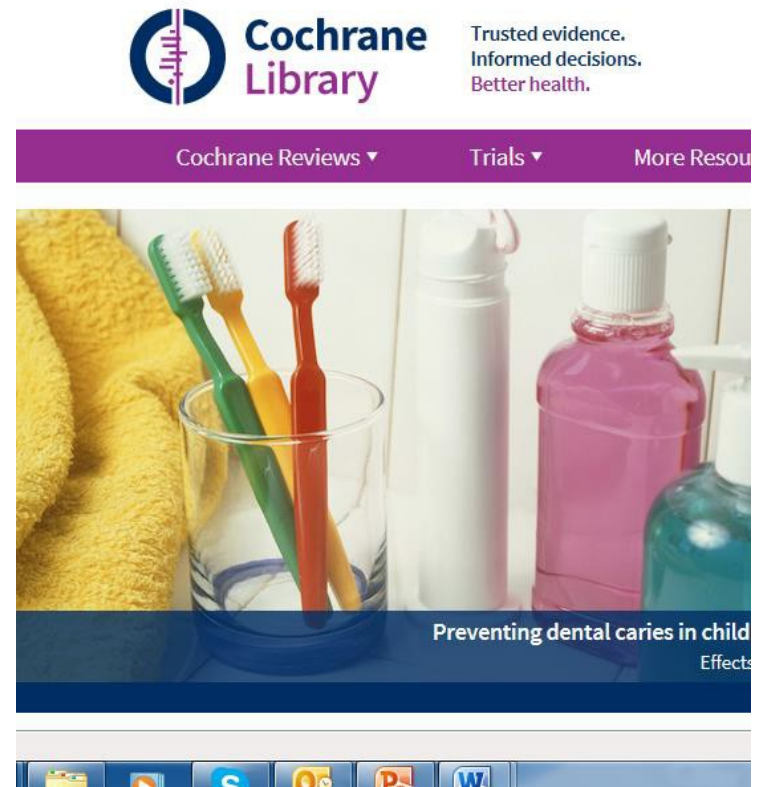


# How to find good research?

**Look for systematic reviews like those from the Cochrane collaboration.**

<http://www.cochranelibrary.com/>

Aim of a systematic review is to summarize data from different studies, preferably in one figure.



# How to find good research?

Cochrane Reviews ▼

Trials ▼

Browse to:

## Health & safety at work

Narrow your results

### Topic

- Health & safety at work ←
- ▼ Disability in the workplace (19)
- ▼ Health promotion (12)
- ▼ Managing occupational disease (56)
- ▼ Prevention of occupational disease (24)
- ▼ Reducing injuries (15)

Or go to:

[www.work.cochrane.org](http://www.work.cochrane.org)



# Summary

- Relevant literature can be found in the ESPrIT repository.
- Relevant reviews can be found in the Cochrane Library.
- You have to assess the usefulness and quality of the studies you find.
- Validity and reliability are main components of quality.
- Errors can be random and systematic
- An effect may be explained by confounding factors



# Individual assignment

Select an article from the ESPrIT repository that is useful for the proposal of your group, make a summary and assess it's quality using the concepts discussed in this presentation.

You have 45 minutes

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