UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Methods in Clinic and Epidemiologic Research (e-Learning)

2526-1-F8205B002

Learning objectives

The objectives of the course are: to introduce the uncertainty of the diagnostic process; to critically examine the measures available in the scientific literature about the validity of the diagnosis, the clinical discordance, the frequency of diseases and of outcomes, the association between exposures and risk of disease, as well as the efficacy and clinical impact of treatments. Moreover, the methodological aspects related to the different study designs will be examined in depth in order to acquire the expertise for critically reading the medical scientific literature and writing a protocol of both experimental and observational studies and meta-analyses.

Knowledge and understanding

This Course of Study will provide knowledge and understanding skills relating to:

- Recognize the sources of uncertainty in the clinical process (from the formulation of the diagnosis to the choice of therapy and/or preventive intervention)
- Main measures or summary indicators regarding the validity of the diagnosis, clinical disagreement, the frequency of the disease and its possible outcomes
- Random and systematic errors of clinical measures
- Measures of association between determinants and risk of disease, of efficacy and clinical impact of therapeutic and preventive interventions
- Main designs of experimental or observational clinical studies

Applying knowledge and understanding

At the end of the Course of Study, students will be able to:

- Critically carry out a the scientific literature search
- Calculate and interpret the measures of association between determinants and risk of disease, of efficacy and clinical impact of interventions (therapeutic and/or preventive), of validity of the diagnosis and of clinical disagreement

- Identify and plan the appropriate study design based on the clinical question to be answered, and set up the protocol of an experimental or observational clinical study, or of a meta-analysis

Making judgements

These skills will be developed through the administration of self-assessment tests and intermediate tests.

Communication skills

These skills will be developed through intermediate tests.

Learning skills

Through the teaching methods made available (frontal lessons and in-depth material), at the end of the lessons the student will have the skills to continue studying independently.

Contents

1. Uncertainty of the diagnostic process
2. Frequency of clinical events
3. Random and systematic errors of diagnostic measures
4. Observational and experimental studies
5. Introduction to meta-analyses and guidelines

Detailed program

1. Uncertainty measures of the diagnostic process Uncertainty of the diagnostic process
Operative characteristics of a diagnostic test
Predictive values of a diagnostic test
Multiple tests
Agreement between clinicians

2. Measures of frequency of clinical events and their predictors Incidence and prevalence
Measures of incidence
Measures of association
Measure of impact
The efficacy of treatments

3. Random and systematic errors of clinical measures Precision of measures
Validity of measures
The role of confounding

4. Observational and experimental studies Cohort studies
Case-control studies
Experimental studies

5. Introduction to meta-analysis and clinical guidelines Introduction to systematic reviews and meta-analysis, from data source to meta-analytic estimates by using fixed- or random effect models. Introduction to the main methods for taking into account bias. Guidelines: from the systematic search of the literature to the formulation of

the recommendations adopted in clinical practice.

Prerequisites

No formal prerequisite required.

Teaching methods

E-learning/Frontal lectures.
Teaching material (lectures, scientific papers, readings and other in-depth material) will be provided through the e-learning platform of the University. During each of the five sections the course is divided in, frontal lectures are scheduled in order to deepen and to clarify the main subjects of the course.

Assessment methods

The exam consists of a final oral exam, during which students will be invited to discuss with the teacher the main subjects of the course, with the aim of verifying whether they have achieved the objectives that the course was intended for.

There are no distinctions, during the exam, between attending and non-attending students.

At the end of each section of the course an assignement (i.e. exercises and theorical questions, depending on the topics covered by the relative module) will be foreseen.

However, the final oral exam is not restricted to students who completed all the assignements.

Textbooks and Reading Materials

There is no specific reference text.
For each argument of the course, the teaching material will be available on the e-learning platform (slides of the lectures, exercises, scientific papers).

Semester

I Semester (Period I-II) and II Semester (Period III-IV)

Teaching language

Italian

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING