Systematic Reviews and Meta-Analyses

Course-Syllabus

Autumn ۲۰۱۶

Department of Epidemiology

School of Public Health

Iran University of Medical Sciences

Number: ٥٠١١٢٠٠٠٠

Title: Secondary studies (Systematic Reviews and Meta-analysis)

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Description:

Systematic reviews and meta-analyses are useful for healthcare decision-making as well as evidence-based clinical and public health practice. The widespread and growing application of systematic review methods for the synthesis of evidence on important or pressing research and clinical questions underscore the need for health-care professionals to understand and critique this research design. This course introduces methods for conducting a quantitative research synthesis using meta-analysis. The focus of the course is both practical and methodological and includes background on all parts of the research synthesis process, including: problem formulation, conducting a literature search, data evaluation, effect size coding, data analysis, and reporting the results. Additionally, the statistical methods used for summarizing the effects found in a study (effect sizes) and for combining the results of these studies under different models (meta-analysis) as well as examples of methods to evaluate heterogeneity and publication bias are introduced and developed. STATA and RevMan statistical software will be used to perform meta-analysis during the computer lab, along with tutorials on how to effectively use tools such as PubMed for conducting reviews.

By the end of the semester, students will be able to:

- Conduct a systematic, replicable search of the literature used to identify studies eligible for a meta-analysis.
- Extract and code information from eligible studies based on a clearly defined coding manual.
- Create and analyze meta-analytic databases using appropriate statistical techniques.
- Prepare written reports of meta-analytic findings.

Prerequisites: Basic courses in epidemiology and biostatistics

Requirements for course credit:

Students are required to complete a protocol for a systematic review and meta-analysis. Course credit requires attendance in at least ١٤ of the ١٦ classes and students are expected to participate in class discussions

Class topics and Schedule: Monday, ١٠-١٢ (١٤ PM)

Course text A: Littell JH, Corcoran J, Pillai V. *Systematic Reviews and Meta-analysis*. Oxford: Oxford University Press, ٢٠٠٨.

Course text B: Borenstein M, Hedges LV, Higgins JPT, Rothstein HR. *Introduction to Meta-Analysis.* New Jersey: John Wiley and Sons, ٢٠٠٩.

Course text C : Ansari Moghadam A.R, Poorolajal J, Haghdoost AA, Sadeghirad B, Najafi F. Systematic review & Meta-analysis ; concepts , application & statistical practice . Kermann: Fanoos Publisher; ٢٠١٠

Assignment details: ١٠٠٪ of the course mark

Attendees who are seeking course credit are required to complete a protocol for a systematic review. They should detail their plans for a systematic review of their interest by outlining all proposed rationale, objectives and methods. The format and details included in the sample protocol can be followed as a guide.

Course Outline:

Week	Topic	Approximate coverage
١	**Introduction to Meta-Analysis**	٢ hours
٢	**Problem formulation (locating a meta-analysis in your field)**	٢ hours
٣	**Conducting a literature search**	٤ hours
٤	**Coding and data management**	٢ hours
٥	**Effect size calculations (continuous data)**	٢ hours
٦	**Effect size calculations (discrete data)**	٢ hours
٧	**Effect size calculations (correlations, converting between types)**	٢ hours
٨	**Combining effect sizes, fixed and random effects models I**	٤ hours
٩	**Combining effect sizes, fixed and random effects models II**	٤ hours
١٠	**Meta-regression & subgroup analyses**	٢ hours
١١	**Correlated and dependent effects**	٢ hours
١٢	**Publication bias**	٤ hours
١٣	**Reporting standards**	٤ hours
١٤	**Critical appraisal**	٤ hours
١٥	**Practice with STATA and RevMan**	٤ hours
١٦	**Final project presentations**	٤ hours