

Course Plan

Course Name: Research Methodology

Number of Units: 1 (theoretical: 1, practical: 0)

Prerequisite or simultaneous course: No

School: Health

Department: Epidemiology and Biostatistics

Degree: Master of Clinical Imaging / International

Faculty member: Dr. Asieh Mansouri

Major Aims: Getting to know the concepts of scientific research and the ability to design, conduct, and write a scientific research study and manuscript

Outlines

1. Fundamental concepts of research (definition of research methodology, types of research, etc.)
2. Criteria for selecting a research topic
3. Concepts and types of research methodologies (study designs)
4. Concepts of population and sample, sampling methods, and sample size estimation
5. Types of research variables and scientific/operational definitions of variables
6. Detailed structure and components of a research proposal
7. Dissemination and publication of research findings

References:

1. Laake P, Benestad HB, Olsen BR, editors. Research methodology in the medical and biological sciences. Academic Press; last edition
2. Dowson C, Introduction to Research Methods: A Practical Guide for anyone undertaking a research project. www.howtobooks.co.uk last edition.
3. Corlien M. Varkevisser Indra Pathmanathan Ann Brownlee, Designing and conducting health research project: volume 1 project development. World Health Organization Regional Office for Africa.
4. Gordis Epidemiology, The last Edition, by David D Celentano, Moyses Szklo

Method of teaching: lecture, discussion, Practical Exercises

Student evaluation method: The final exam is 50%; the Proposal is 50%.

Course sessions:

<p>1. Course orientation and foundational concepts Students will be able to explain the fundamental principles of research methodology, define a research proposal, describe the proposal structure required by Isfahan University of Medical Sciences, apply criteria for selecting a feasible research topic, and formulate a clear and scientifically sound research title. (online)</p>
<p>2. Problem statement and literature review Students will be able to develop a coherent problem statement, conduct a structured literature review, synthesize scientific evidence, and effectively use reference management software for citation and bibliography organization. (online)</p>
<p>3. Objectives, research questions, and hypotheses Students will be able to formulate general and specific objectives, develop research questions and testable hypotheses, and construct a comprehensive variables table with appropriate conceptual and operational definitions. (online)</p>
<p>4. Study designs Students will be able to distinguish between different types of study designs, justify the selection of an appropriate design for a given research question, and critically appraise methodological strengths and limitations. (online)</p>
<p>5. Sampling and sample size estimation Students will be able to define the study population, determine inclusion and exclusion criteria, identify potential sampling errors and biases, select appropriate sampling methods, and perform sample size calculations.</p>
<p>6. Data collection and measurement validity Students will be able to select appropriate data collection methods and instruments, evaluate validity and reliability, identify potential measurement errors, and design data collection forms compatible with statistical software for accurate data entry and analysis.</p>
<p>7. Ethical and managerial aspects of research Students will be able to address ethical considerations in research, identify study limitations, declare potential conflicts of interest and commercial benefits, and apply principles of time, budget, and human resource management in research projects.</p>
<p>8. Scientific reporting and dissemination Students will be able to prepare a structured final research report, differentiate between types of scientific articles, write a publishable manuscript, and follow standard procedures for submission to peer-reviewed journals and scientific conferences.</p>