

CMED-304

Research Methodology & Biostatistics

Course Specification

Institution: King Saud University

College/Department : Family and Community Medicine, College of Medicine

Course Identification and General Information

1. Course title and code: CMED-304 (Research Methodology and Biostatistics)
2. Credit hours: 6 hours
3. Name of faculty member responsible for the course, Dr Amna Rehana Siddiqi & Dr. Shaffi Ahmed
4. Level/year at which this course is offered: Third year
5. Location: on main campus

Course Objectives

- Understand the basic concepts, terms and definitions used in health research methodology
- Select a relevant research topic based on contemporary literature
- Formulate a research question, hypotheses and related objectives (general and specific)
- Compare basic quantitative (observational and experimental) study designs, understand their advantages, disadvantages and select the best for a specific research question
- Understand basic concepts of qualitative research and methods
- Select best sampling method for the chosen design and estimate sample size
- Design a simple questionnaire used for data collection
- Recognize the main sources of measurement error in health research
- Carry out simple analysis of collected data and interpret findings appropriately
- Compute, apply and interpret point estimates, confidence intervals and p-values
- Test hypotheses using suitable tests of statistical significance
- Apply ethical principles in each step of health research
- Construct a research protocol
- Conduct simple health research project in a group
- Submit a joint research project report

Course Description

TOPICS to be COVERED	No. of Weeks	Contact Hours
<p>FIRST SEMESTER</p> <ul style="list-style-type: none"> • Introduction to research methodology • Ethics in health research: concepts • Research ideas and selection of a research topic <ul style="list-style-type: none"> ○ Tutorial: selection of research topic • Literature review <ul style="list-style-type: none"> ○ Tutorial: using web-based search and grey literature • Rationale and research hypotheses <ul style="list-style-type: none"> ○ Tutorial: rationale and research hypotheses • Formulation of a research question & objectives <ul style="list-style-type: none"> ○ Tutorial: formulation of a research question & objectives • Study designs: An Overview • Observational studies (characteristics, advantages, disadvantages, frequency & effects measures – where applicable) <ul style="list-style-type: none"> ○ Case-reports and case-series (theory / tutorial) ○ Cross sectional studies (theory / tutorial) ○ Case-control studies (theory / tutorial) ○ Cohort studies (theory / tutorial) ○ Ecological studies (theory / tutorial) • Experimental studies <ul style="list-style-type: none"> ○ Randomized clinical trials (theory / tutorial) ○ Community intervention studies (theory / tutorial) • Qualitative research designs: concepts and issues (theory / tutorial) • Criteria for selection of a study design (theory / tutorial) • Sampling <ul style="list-style-type: none"> ○ Types of samples (theory / tutorial) ○ Sample size estimation (theory / tutorial) • Tools for Data Collection (theory / tutorial) • Questionnaire Design (theory / tutorial) • Writing a research proposal / protocol (draft to be submitted by the end of the first semester) • Research project planning (group assignment, through end of the second semester) • Time-planning (theory / tutorial) • Ethics in health research: applications and authorship (theory / tutorial) 	15	45

<p>SECOND SEMESTER</p> <ul style="list-style-type: none"> • Biostatistics: an overview • Variables in health research: concepts and applications (theory / tutorial) • Summary and variability measures (theory / tutorial) • Normal distribution and hypothesis testing (theory / tutorial) • Applications and interpretation of 95 % confidence intervals and p-values (theory / tutorial) • Statistical testing (z-test, t-test, chi-squared test, Fisher's exact test, McNemar's test, Mantel Hansel test): theory / tutorial • Correlation & simple regression (theory / tutorial) • Measurement error in research (chance, bias, confounding) • Presentation & interpretation of statistical software outputs (theory / tutorial) • Scientific writing and publishing health research (theory / tutorial) • Presenting a scientific paper / poster (theory / tutorial) 	15	45
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2 Course components (total contact hours per semester):				
Lecture: 30 (1 st); 15 (2 nd)	Tutorial: 15(1 st); 30 (2 nd)	Laboratory:NA	Practical/Field work/Internship	Other:

Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Assignments		10%
2	Written Exam(MCQ & Short answers)(At the end of 1 st semester)		25%
3	Written Exam(MCQ & Short answers)(At the end of 2nd semester)		25 %

4	Research Report	40%*
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**Needs to be passed separately as 40% for report and other 60% for course content*

Student Support

Arrangements for availability of faculty for individual student consultations and academic advice. (amount of time faculty are available each week)

- Three hours in a week by each of faculty, on all weeks during the course.

E Learning Resources

1. Required Text(s)
2. Essential References : Stated in Lecture handouts
- 3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)
 - Designing Clinical Research by Stephen Hulley 3rd Edition
 - Practical Epidemiology, by Barker DJP.
 - Statistical methods in medical research, by Armitage.
 - An Introduction to Medical Statistics, by Martin Bland.
 - Medical Statistics: A commonsense approach, By Michael J. Campbell & David Machin
- 4- Electronic Materials, Web Sites etc
- 5- Other learning material such as computer-based programs/CD, professional standards/regulations

Facilities Required

1. Accommodation (Lecture rooms, laboratories, etc.)
 - Lecture rooms are available.
2. Computing resources
 - Need an exclusive computer lab with a capacity of 25 computer terminals.
3. Other resources
 - Statistical software needed (SPSS, Minitab, Stata and EGRET)

Last revised, 2011 by: Dr. Amna Rehana Siddiqi