Module Title	Research Methodology				
Module Code	FMED-590C				
Module Type	Required				
Level	2nd Cycle				
Year / Semester	2 / 3				
Teacher's Name	Module Lead: Dr Elena Critselis Module Contributor: Dr Lina Tolma				
ECTS Credits	10	Lectures	16	Interactive learning activities	23
Module Purpose and Objectives	The main objectives of the module are to: • Assess the needs for conducting a research study in the context of Primary Care and generate relevant and testable research questions. • Systematically search for evidence in the literature using the appropriate search engines and databases (e.g. PubMed Health, Cochrane Library) and critically evaluate the existing literature, identifying gaps in knowledge on topics relevant to Primary Care. • Interpret research findings (measures of disease frequency, associations, and diagnostic tool performance) of published literature and critically appraise how different types of systematic bias could affect their validity, articulating strategies to avoid these in different study designs. • Design quantitative (epidemiological) research studies including selection of most appropriate i) study design (observational or interventional for a given research question, ii) study population, iii) sampling method, iv) accurate variable assessment method(s), v) statistical approach for hypothesis testing and generating and presenting results appropriately, as well as deriving relevant conclusions. • Design qualitative research studies, involving participant observations, individual interviews, and focus groups for answering a research question in the context of Primary Care. Compose a comprehensive research proposal for a grant application for funding by national or international funding bodies. • Compose a comprehensive research proposal for a grant application for funding by national or international funding bodies.				
Learning Outcomes	After completion of the module students are expected to be able to: • Identify issues compromising Primary Care and assess the needs for conducting a research study to address these. • Identify gaps in knowledge on research topics relevant to Primary Care and generate relevant and testable research questions in the context of Primary Care using the PICO/PECO format. • Systematically search for evidence using appropriate search engines and databases (e.g. PubMed Health, Cochrane Library, etc) and critically evaluate the existing literature, identifying gaps in knowledge on topics relevant to Primary Care. • Choose the most appropriate study design for answering specific research questions relevant to Primary Care. • Design quantitative observational research studies to answer a research question in the context of Primary Care.				

	• Design quantitative interventional research studies for answering a research question in the context of Primary Care. • Choose the most appropriate population sampling method for a given research scenario relevant to Primary Care. • Estimate sample size requirements by performing study power analysis. • Select accurate variable assessment methods for a given research scenario relevant to Primary Care. • Calculate, interpret and critically appraise sensitivity, specificity, PPV and NPV of screening and diagnostic tools. • Critically appraise how different types of selection and information bias could affect the validity of different study designs and articulate strategies to avoid these. • Interpret research findings (measures of disease frequency, associations, and diagnostic tool performance) of published literature and of systematic reviews/meta-analysis (forest plot). • Choose the appropriate statistical analysis for a given research scenario requiring calculation and interpretation of measures of association with binary and numeric outcomes (i.e. odds ratio, relative risk, regression coefficient and mean difference). • Critically appraise how the multifactorial nature of disease, as well as the concepts of confounding and effect mediation, could affect the validity of research findings. • Distinguish between association and causation and critically appraise criteria for inferring causality for a given association. • Compare, contrast and differentiate the concept of external study validity (generalizability) from internal study validity. • Design a protocol for evidence synthesis similar to PROSPERO or Cochrane protocol for systematic reviews to answer a research question in the context of Primary Care. • Critically evaluate systematic reviews and interpret the results from meta-analyses (i.e. forest plots) for answering specific research questions relevant to Primary Care. • Critically appraise the major methodologies used in qualitative research involving participant observations, individual interviews and/or focus groups, and design a suitable qualitative study for answering specific research questions in the context of Primary Care. • Compose a complete research proposal for a grant application for funding by national or international funding bodies. • Present expected study findings based on the proposed research hypothesis and question and implications relevant to Primary Care. • Derive conclusions based on study findings. • Write-up a scientific article presenting original study findings relevant to Primary Care. • Perform an oral presentation on original study findings relevant to Primary Care. • Communicate study results and conclusions to the media and lay audiences.		
Prerequisites	None	Required	For students on the

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<tr><td></td><td></td><td></td><td>Research Pathway, FMED-590C is required for FMED-591C</td></tr>
<tr><td>Module Content</td><td colspan="3">1. Introduction to Research Methods in Primary Care: Assessing research needs
2. Generating research questions and systematically searching and critically evaluating the existing literature
3. Observational study designs: Cross-sectional, case-control and cohort studies
4. Interventional study designs: Randomized controlled trials and other non-randomized trials
5. Sampling methods and estimating sample size requirements
6. Data collection and accurate variable assessment
7. Systematic error in research: Selection and information bias (measurement error)
8. Choosing an appropriate statistical technique and performing analyses
9. Measures of association
10. Confounding and effect mediation
11. Causality in medical research: Association vs causation
12. Internal and external study validity: Interpreting meta-analyses
13. Qualitative research study designs
14. Communicating research findings to the public</td></tr>
<tr><td>Teaching Methodology</td><td colspan="3">This programme is delivered via distance learning (online) and includes recorded lectures, interactive online tutorials (Webinars) and discussion forums, as well as online exercises, quizzes, and other activities.</td></tr>
<tr><td>Bibliography</td><td colspan="3">Required Textbooks / Reading:

<table>
<tr><th>Title</th><th>Author(s)</th><th>Publisher</th><th>Year</th><th>ISBN</th></tr>
<tr><td>Concepts of Epidemiology: Integrating the ideas, theories, principles, and methods of epidemiology (3 ed.)</td><td>Raj S. Bhopal</td><td>Oxford University Press</td><td>2016</td><td>978-019873 9685</td></tr>
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Recommended Textbooks / Reading:

<table>
<tr><th>Title</th><th>Author(s)</th><th>Publisher</th><th>Year</th><th>ISBN</th></tr>
<tr><td>Epidemiology in Medicine 1st Edition</td><td>Hennekens (Author), Julie E. by Charles</td><td>Sherry L. Mayrent (Editor)</td><td>1987</td><td>978-031635 6367</td></tr>
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	H. Buring (Author),				
Gordis Epidemiology 6th Edition	de David D Celentano ScD MHS, Moyses Szklo MD	Elsevier	2018	032355 2293
Modern Epidemiology (4th Edition)	Timothy L. Lash, Tyler J. VanderWeele, Sebastien Haneuse, Kenneth J. Rothman	LWW	2021	145119 3289
Mastering Primary Care: A Postgraduate Guide to Examinations and Revalidation, (2nd ed.)	Lewis G, Sheringham J, Bernal JL, Crayford T	CRC Press	2014	978-144415 2692
Research methods in community medicine: surveys, epidemiological research, programme evaluation, clinical trials	Abramson, J. H.	Wiley	2008	978-047098 6615
Research Methods in Health: Investigating Health and Health Services	Ann Bowling	Open University Press	2009	978-033523 3649
Doing a Systematic Review: A	Boland A, M, Cherry G, Dickson R.	SAGE Publications Ltd	2013	978-144626 9688

	Student's Guide (1st ed.)				
	Cochrane Handbook for Systematic Reviews of Interventions (Ver. 5.1.0)	Higgins JPT, Green S.	The Cochrane Collaboration	2011	978-047069 9515
	Introduction to Meta-Analysis (1st ed.)	Borenstein M, Larry V. Hedges LV, Higgins JPT, Rothstein HR	Wiley	2009	978-047005 7247
	Qualitative Methods in Primary Care: A Field Guide for Applied Research (2nd ed.)	Tolley EE, Ulin PR, Mack N, Robinson ET, Elizabeth T. Robinson, Succop SM	Jossey-Bass	2016	978-111883 4503
Assessment	• Research proposal PICO/PECO (10%) • Research proposal abstract (10%) • Research proposal for grant application (80%)				
Language	English				