Al-Farabi Kazakh National University Faculty Medicine and HealthCare
Education program on specialty:
“8D10101 Public Health “Research Methods”

PROGRAM OF THE FINAL EXAM FOR COURSE “RESEARCH METHODS”

5 credits

Author:

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TMC OF COURSE IS CONFIRMED

On Academic Council of Medicine and Public Care Faculty
Protocol N , .
Reviewed and recommended at the meeting of Epidemiology, Biostatistics and Evidence-Based Medicine Department from *«04 » 01. 2025, Protocol N 2*
Recommended by the faculty methodical bureau
« 04 » 01 2025., Protocol N 1

Almaty, 2025

PROGRAM OF THE FINAL EXAM ON COURSE "RESEARCH METHODS"

5 credits

This course will provide a comprehensive overview of selected research and quantitative methods used in conducting health services research. The course will address all phases of the research process, from generating research questions and hypotheses to study design, sampling, measurement, data collection, and data analysis. The proper use of statistical methods and computer applications for secondary data analysis will also be covered. This course serves as a foundational step in developing your research project.

Upon completion of the course, the student will be able to

1. To demonstrate knowledge of the process of generating scientific theory.
2. To possess knowledge and skills in selecting research to address population health issues.
3. To determine the appropriate epidemiologic designs and types for addressing public health issues.
4. Be able to plan and write a research proposal.
5. Be able to conduct research using the knowledge and skills acquired in this course.

List of examination items for preparation to exam

MODULE 1 PUBLIC HEALTH RESEARCH BASUCS

S 1. Research Review and Research Question Development.
The major characteristics and process of health services research. The Challenges in Conducting Social Science Research.
S 2. Research Strategies and Design. Sampling methods and sampling size.
Epidemiologic studies: observational and experimental. Observational studies encompass both descriptive and analytical study designs.
S 3. Descriptive epidemiological studies.
Descriptive studies: case reports, case series, ecological and cross-sectional.
S 4. Analytical epidemiological studies.
Analytical studies. Case-control study: strength and limitations, using in Medicine. Measures of association or measures of excess risk. OR, RR, AR, AR%, PAR, PAR%.
S 5. Experimental studies (Clinical Trials).
Randomized controlled trial and non-randomized trial. Stratified, crossover, factorial design and group randomization. Design of clinical trials (phases, safety and effectiveness of drugs).
S.6. Diagnostic and Screening Tests.
Sensitivity and specificity of tests. Content. A diagnostic test is used to determine the presence or absence of a disease when a subject shows signs or symptoms of the disease. A screening test identifies asymptomatic individuals who may have the disease. The diagnostic test is performed after a positive screening test to establish a definitive diagnosis.
S.7. Bias and confounding.
Bias may be defined as any systematic error in an epidemiological study that results in an incorrect estimate of the true effect of an exposure on the outcome of interest.Confounding provides an alternative explanation for an association between an exposure (X) and an outcome. It occurs when an observed association is in fact distorted because the exposure is also correlated with another risk factor.
S 8. Basic risk measurement.
It refers to the fundamental techniques used to quantify the potential for loss in an investment or portfolio. Common measures include: Standard Deviation: Measures the dispersion of returns around the mean (volatility).Beta: Indicates an asset's sensitivity to market movements (systematic risk). Value at Risk (VaR): Estimates the maximum potential loss over a specific time frame at a given confidence level. Sharpe Ratio: Evaluates risk-adjusted returns by comparing excess return to volatility.

S. 9. Qualitative Studies Design, Data collection and Analysis.
Qualitative research explores subjective experiences, behaviors, and social phenomena through non-numerical data. Common designs include case-study, ethnography,
S. 10. Mixed Methods Research: Quantitative and Qualitative Results in Health Science.
Mixed methods research (MMR) combines quantitative (numerical) and qualitative (descriptive) approaches within a single study to provide a more comprehensive understanding of health-related issues. It includes Explanatory Sequential (quantitative data), Exploratory Sequential (qualitative research, e.g., patient interviews), and Convergent (Triangulation), which collects both types of data simultaneously and compares or combines the findings.
S.11 Construction of Research Proposal.
A research proposal is a structured document that outlines the plan, objectives, methodology, and significance of a proposed research project. It serves as a blueprint for conducting the study and seeks approval from supervisors, funding agencies, or an ethics review board. It includes an Introduction, Objectives, Methodology (research design, Data collection, Sampling strategy, Data analysis plan, Timeline, Ethical Considerations, and references.
S. 12 Survey Research.
A quantitative method collecting data from a sample population via questionnaires or interviews to generalize findings to a larger group. It uses structured (closed-ended) or unstructured (open-ended) questions. It is common in social sciences, marketing, and public health.
S. 13. Statistical Analysis.
The process of applying statistical techniques to interpret data, identify patterns, and test hypotheses. It includes techniques as descriptive stats (mean, median, standard deviation), Inferential stats (t-tests, ANOVA, regression) and supports evidence-based conclusions.
S. 14. Secondary Analysis.
It reuses existing datasets (collected by others) for new research questions cost-effective and time-saving. Sources for this analysis include government reports and academic databases.
S. 15. Summarizing and Visualizing Data
It means presenting data clearly through summaries (tables and statistics) and visuals (graphs and charts).

Typology and approximate content of examination tasks:

Each exam ticket includes 3 questions on the above course topics.

1) key competency; 2) general competency relate to a certain circle of subjects and educational areas; 3) subject competency relates is private in relation to the two previous ones, having a specific description and the possibility of forming educational subjects.

Block	Example question	Determining the level of competencies
Block 1. Questions aimed at identifying cognitive competencies.	Conceptualization of Health Services Research	PhD student demonstrates knowledge of the process of generating scientific theory.
Block 2. Questions defining system competencies.	Generating and creating research proposals.	PhD student shows ability generating research questions and hypotheses to create own research proposals.
Block3. Questions regarding the definition of functional competencies.	Evaluate and select research methods design.	PhD students evaluate and select research methods for Public Health Issues.

Grades:

Grade	Digital equivalent points	points, % content	Assessment according to the traditional system
A	4.0 _	95-100	Excellent
A-	3.67	90-94	
B+	3.33	85-89	Good
B	3.0	80-84	
B-	2.67	75-79	
C+	2.33	70-74	
C	2.0	65-69	Satisfactorily
C-	1.67	60-64	
D+	1.33	55-59	Unsatisfactory
D	1.0	50-54	

Required and Recommended Reading

Required reading:

1. Gordis, Leon, Epidemiology, 5th Edition, W.B. Saunders Company, 2013.
2. Aschengrau A., Essentials of Epidemiology in Public Health, 3rd Edition, 2008
3. Rothman K., Modern Epidemiology, 3rd Edition, 2008

Recommended reading:

4. Kaplan USMLE, Lecture Notes, Behavioral Sciences and Social Science, 2017.-229p.
5. Fundamentals of Biostatistics. Seventh Edition. Rosner. - 2016.-856 p.
6. HEALTH RESEARCH METHODOLOGY. WORLD HEALTH ORGANIZATION.Manila, 2010.
7. Evidence-Based Medicine. How to Practice and Teach EBM (3rd Edition). S.E. Straus, W.S. Richardson, Paul Glasziou, R. Brian Haynes.
8. Literature Reviews in Social Work. Robin Kiteley and Christine Stogdon - 2014.-20 p. Additional literature.
9. Evidence-Based Answers to Clinical Questions for Busy Clinicians Workbook - 2009.- 26p.
10. Appraisal of Guidelines for Research & Evaluation II. The AGREE Next Steps Consortium May 2009.- 52 p.

1. Wolfgang, A. Handbook of Epidemiology. Vol.1//Ahrens Wolfgang, Peugeot Iris. - 2 ed.- Springer Reference, 2014.- 469 p.
2. Principles and methods of Epidemiology. 3-d Edition. R. Dicker Ooffice of epidemiologic program СДС, USAID. -2012.-457 P.
3. Principles of Epidemiology in Public Health Practice. Third Edition. An introduction to Epidemiology and Biostatics.US, CDC, Atlanta. -2012.-6-75 p.
4. Hennekens, C., & Buring, J. (1987). Epidemiology in Medicine, Boston/Toronto: Little, Brown and Company.
5. Kelsey, J., Whittemore, A., Evans, A. & Thompson, D. (1996). Methods in Observational Epidemiology, Second Edition, New York: Oxford University Press.

Electronic source:

6. www.who.org
7. www.cdc.gov
8. www.medline
9. www.cockraine.library
10. www.PubMed