



MASTERS OF SCIENCE IN NURSING AND MIDWIFERY A.A. 2021/2022

Course: RESEARCH, SCIENTIFIC EVIDENCE AND EVALUATION SYSTEMS FOR HEALTHCARE ACTIVITIES

Year: first

Period available (1°-2° semester – annual): 2° semester

University Credits: 9

Learning objectives

Students will acquire the necessary knowledge to:

- understand the research process and its different qualitative-quantitative approaches;
- understand the meaning of evidence- based practice and the implications of nursing and midwifery decision making;
- understand the main statistical tests and principles to create research databases.

Students will be able to apply their knowledge to:

- plan a research project in the disciplinary field;
- transform a clinical care problem into one or more questions to be searched in the clinical literature;
- set up a bibliographic search strategy and consult the main professionally-relevant databases;
- read and critically evaluate a research article;
- apply the main statistical tests and principles to create research databases;
- activate strategies to transfer research results into nursing care.

Pre-requisites

For INF/01 module: Computer Science



For SECS-S/02 module : Computer Science, Medical Statistics

Content

Research Methodology and EBHC - MED/45

Introduction to nursing research: The different types of research and the choice of research designs according to the study.

- Quantitative research
- The research process
- Problems, questions and research hypotheses
- Literature review
- Quantitative research designs
- Sampling
- Good clinical practice and research ethics
- Practical activity (from problem to study)
- EBP
- Evidence-based medicine
- Systematic reviews. Primary, secondary and tertiary studies
- The PICO. Evidence search and practical activity
- Databases
- Qualitative research
- The qualitative research protocol: what it investigates, contexts, sample, data collection tools and analysis.
- The different types of sampling in qualitative research - Methods of data collection: interviews (types and meaning) and observation.
- The analysis process and the different types of labelling
- Mixed research
- Scientific research in healthcare settings, indicators of care outcomes

Practical activity (from problem to study)

- Critical evaluation of studies
- Practical activity



Medical statistics - MED/01

Measurement systems: measurement scales, validity, precision and accuracy;

- Statistical variables and frequency distributions;
- Distribution of one or more variables: measures of position and variability, contingency tables;
- Introduction to biostatistics: synthesising data;
- Measures of disease frequency and measures of association;
- Brief summary of the main study designs: observational and experimental studies;
- Basic statistical analyses;
- Meta-analysis and GRADE system;
- Familiarising and basic use of statistical software (STATA).

Computer tools for research - INF/01

- Collection, organisation and ascription of research data;
- Knowledge and use of statistical calculation programmes (R and RStudio);
- Clinical data;
- Database manipulation;
- Data pre-processing;
- Examples of health analytics.

Statistics for experimental and technological research - SECS-S/02

- Calculation of probability;
- Definitions of probability;
- Rules of calculus of probabilities;
- Conditional probability;
- Random variables;
- Bernoulli, Gaussian and Student's t distribution;
- How to assess the validity of a diagnostic tool: sensitivity and specificity, roc curves;
- Inferential statistics;
- Sampling theory;
- Sample distribution of an estimator;
- Confidence intervals;



- Logics of Statistical testing: null and alternative hypotheses, first and second errors, power of a statistical test, p-value, z-test and t-test;
- Descriptive analysis of a multivariate dataset. Risk profiling: unsupervised clustering;
- Contingency table analysis: non-parametric tests and ORs;
- Models and predictions: the linear and generalised linear model; survival analysis.

Teaching and learning activities and teaching methods

Lectures and practical activities.

Assessment method

The final exam will consist in an oral and a written exam.

The written exam will consist of two parts: delivery of a research project, based on the instructions given during the lectures, and a written test.

- The written exam will consist of 31 multiple choice answers (1 point for each correct answer)
The mark of the written exam will be equal to the number of correct answers. Students must score at least 18/31 to be eligible for the discussion of the research project.
- The oral exam will consist in the discussion of the research project submitted at least 15 days prior to the exam date and theoretical questions about the course programme.
- The overall mark will be made up as follows:
 - 40% written test mark
 - 30% research project mark
 - 30% oral exam mark
- "Cum laude" will be awarded to students who achieve a mark of over 30/30.
- The results will be published in 15 working days.



Suggested readings

Research Methodology and EBHC - MED/45

- Polit Denise F.; Tatano Beck Cheryl; Palese A. (curatore), Fondamenti di ricerca infermieristica, THE MCGRAW-HILL COMPANIES, 2018 2^a edition
- Articles suggested during the lessons.

Medical Statistics - MED/01

- Bland M., An Introduction to Medical Statistics. Oxford University Press.
- Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. Lippincott Williams & Wilkins.
- Principles of Epidemiology in Public Health Practice. An Introduction to Applied Epidemiology and Biostatistics. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). URL: <https://www.cdc.gov/csels/dsepd/ss1978/SS1978.pdf>

Computer tools for Research - INF/01

- Ieva F., Masci C., Paganoni A.M., Laboratorio di Statistica con R, Editore: Pearson, Anno edizione: 2016.
- Specific books found in specialised bookshops.

Statistics for experimental and technological research - SECS-S/02

- Bland, M., An Introduction to Medical Statistics - 4th Edition, Oxford University Press, 2015.
- Ieva F., Masci C., Paganoni A.M., Laboratorio di Statistica con R, Editore: Pearson, Anno edizione: 2016
- Hosmer, D.W., Lemeshow, S. (2008) Applied Survival Analysis. John Wiley & Sons.
- Agresti, A. (2002) Categorical Data Analysis. Wiley Interscience
- Statistical Learning MOOC by Hastie and Tibshirani, <https://www.edx.org/course/statistical-learning>
- James G., Witten D., Hastie T. and Tibshirani R., An introduction to statistical learning, with application to R, Editore: Springer, New York, Anno edizione: 2013 <http://www-bcf.usc.edu/gareth/ISL/getbook.html>