



IDENTIFYING DATA

(*)Metodoloxía da investigación

Subject	(*)Metodoloxía da investigación			
Code	P05M191V01103			
Study programme	Máster Universitario en Ejercicio terapéutico en fisioterapia			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	9	Mandatory	1st	1st
Teaching language	Spanish Galician			
Department				
Coordinator	González Represas, Alicia			
Lecturers	González Represas, Alicia Maceiras García, María Lourdes Seoane Pillado, María Teresa			
E-mail	alicia@uvigo.es			
Web				
General description	The Research Methodology course describes the context and legislation in clinical-epidemiological research, the methodology to be followed in the design of clinical-epidemiological research, development of research projects, data analysis and communication of results.			

Training and Learning Results

Code	
A1	Possess and understand knowledge that provides a foundation or opportunity to be original in the development and/or application of ideas, often in a research context.
A2	That the students know how to apply the knowledge acquired and their ability to solve problems in new or little-known environments within broader (or multidisciplinary) contexts related to their area of study.
A3	That the students are able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
B2	Incorporate the ethical and legal principles of the physiotherapist profession into professional practice, as well as integrate social and community aspects in decision-making in interventions focused on Therapeutic Exercise in Physiotherapy.
B4	Acquire advanced scientific training in research in Therapeutic Exercise in Physiotherapy.
B6	Develop learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.
C1	Incorporate scientific research and evidence-based practice as a professional culture in the practice of therapeutic exercise.
C2	Apply the ethical and legal bases of the profession in the field of research.
C7	Evaluate and select the appropriate scientific theory and the precise methodology to design a research project based on therapeutic exercise.
C8	Know how to use methods and models of statistical analysis, interpret and communicate the results of clinical research to specialized audiences through different media (face-to-face, online or social networks).
D2	Ability to communicate orally and in writing in the Galician language.
D4	Knowledge of statistics applied to Health Sciences, or to the field of study related to the field of study.
D8	Maintain an attitude of learning and improvement.

Expected results from this subject

Expected results from this subject	Training and Learning Results
------------------------------------	-------------------------------

LO1: Know how to design and carry out a clinical-epidemiological research study.	A1 A2 A3 B2 B4 C1 C2 C7 C8 D2 D4 D8
LO2: Know how to write a clinical research project.	A1 A2 A3 B2 B4 B6 C1 C2 C7 C8 D2 D4 D8
LO3: Know how to interpret and communicate the results of clinical research.	A1 A2 A3 B4 B6 C1 C7 C8 D2 D4 D8

Contents

Topic	
Theoretical content:	1.1. Epidemiology and health-related phenomena.
1. Advanced methods in epidemiology.	1.2. Measures of frequency and effect of the disease.
	1.3. Biases and confounding factors.
2. Clinical-epidemiological studies.	2.1. Descriptive.
	2.2. Analytics.
	2.3. Intervention
3. Advanced methods and models of Statistical Data Analysis.	3.1. Preparation of data in clinical research
	3.1.1. Sources and Instruments for obtaining data
	3.1.2. Sampling. Different sampling techniques. Assignment of subjects to treatments
	3.2. Linear models
	3.2.1. Linear, simple and multiple regression models
	3.2.2. ANOVA models. ANCOVA models
	3.2.3. Logistic regression models
	3.3. Introduction to Meta-analysis
	3.3.1. General concepts. effect size
	3.3.2. Fixed Effects and Random Effects Model
	3.3.3. The problem of heterogeneity
	3.3.4. Publication bias
5. Ethics and legislation in health research.	5.1. Basic ethical principles.
	5.2. Ethical requirements in research.
	5.3. Research ethics committee.
	5.4. Ethics and scientific publication.
	5.6. Health research regulations
6. Design and clinical research projects.	6.1. Design and planning of the research project.
	6.2. Resources to develop a research project.
	6.3. Research project management.

7. Communication of clinical research.	7.1. Scientific communication. 7.1.1. Scientific communication media. 7.1.2. Language in scientific communication. 7.1.3. Resources. 7.2. Scientific publication.
Practical contents	1.1. Analysis and interpretation of results
1. Advanced methods of epidemiology.	
2. Clinical-epidemiological studies.	2.1. Design of clinical-epidemiological studies
3. Advanced statistical data analysis methods and models.	3.1. Linear models. Interpretation of results. 3.2. Meta-analysis. Interpretation of results.
4. Design and clinical research projects.	4.1. Design of research projects. 4.2. Management of research projects.
5. Communication of clinical research.	5.1. Scientific communication.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	24	50	74
Case studies	15	10	25
Collaborative Learning	6	0	6
Discussion Forum	0	4	4
Practices through ICT	12	60	72
Problem solving	9	10	19
Mentored work	0	19	19
Objective questions exam	2	0	2
Problem and/or exercise solving	3	0	3
Essay	1	0	1

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Lecturing	Presentation by the teacher of the contents on the subject object of study, theoretical bases and / or guidelines of a work, exercise that the student has to develop.
Case studies	Analysis of a fact, problem or real event in order to know it, interpret it, solve it, generate hypotheses, test data, reflect, complete knowledge, diagnose it and train in alternative solution procedures.
Collaborative Learning	It includes a group of teaching procedures that start from the organization of the class in small mixed and heterogeneous groups where the students work in a coordinated way with each other to develop academic tasks and delve into their own learning.
Discussion Forum	Activities developed in a virtual environment in which diverse and current topics related to the academic and / or professional field are discussed.
Practices through ICT	Knowledge application activities in a specific context and the acquisition of basic and procedural skills in relation to the subject, through ICT.
Problem solving	Activity in which problems and / or exercises related to the subject are formulated. The student must develop the analysis and resolution of problems and / or exercises independently.
Mentored work	The student, individually or in groups, prepares a document on the subject or prepares seminars, research, reports, essays, summaries of readings, lectures, etc.

Personalized assistance

Methodologies	Description
Lecturing	In addition to the attention to students in the established tutorials and depending on the topic to be addressed, students will also be served via email and the remote campus platform at the times available and agreed by both parties. The aim of personalized attention will be to answer any questions that may arise regarding the subject and / or to advise in academic and professional matters in those cases that so request.
Case studies	In addition to the attention to students in the established tutorials and depending on the topic to be addressed, students will also be served via email and the remote campus platform at the times available and agreed by both parties. The aim of personalized attention will be to answer any questions that may arise regarding the subject and / or to advise in academic and professional matters in those cases that so request.

Collaborative Learning	In addition to the attention to students in the established tutorials and depending on the topic to be addressed, students will also be served via email and the remote campus platform at the times available and agreed by both parties. The aim of personalized attention will be to answer any questions that may arise regarding the subject and / or to advise in academic and professional matters in those cases that so request.
Practices through ICT	In addition to the attention to students in the established tutorials and depending on the topic to be addressed, students will also be served via email and the remote campus platform at the times available and agreed by both parties. The aim of personalized attention will be to answer any questions that may arise regarding the subject and / or to advise in academic and professional matters in those cases that so request.
Mentored work	In addition to the attention to students in the established tutorials and depending on the topic to be addressed, students will also be served via email and the remote campus platform at the times available and agreed by both parties. The aim of personalized attention will be to answer any questions that may arise regarding the subject and / or to advise in academic and professional matters in those cases that so request.
Discussion Forum	In addition to the attention to students in the established tutorials and depending on the topic to be addressed, students will also be served via email and the remote campus platform at the times available and agreed by both parties. The aim of personalized attention will be to answer any questions that may arise regarding the subject and / or to advise in academic and professional matters in those cases that so request.

Assessment

Description	Qualification	Training and Learning Results			
Objective The exam will consist of a set of clear and precise questions, to which the questions exam student must respond by choosing an option from a series of alternatives.	40	A1 A3	B2 B4	C1 C7	D2 D4
Problem and/or exercise solving The student must be able to recognize, describe, organize and analyze the constitutive elements of the problems posed to devise strategies that allow obtaining, in a reasoned way, a contrasted solution and according to certain pre-established criteria. The student's ability to analyze and solve problems and/or exercises autonomously will be assessed.	40	A2	B2 B4	C1 C7	D2 D4
Essay The student must carry out a work in which the contents of the subject will be integrated.	20	A1 A3	B2 B4	C1 C2 C7	D2 D4 D8

Other comments on the Evaluation

Problem solving will account for 40% of the final grade and will consist of solving practical exercises that will be structured in two blocks and must be approved independently.

The objective test represents 40% of the final grade and will consist of a multiple choice test that is structured in two blocks and must be passed independently.

To pass the subject it is necessary to pass the resolution of problems, the objective test and the work of the subject independently.

Students may request the waiver of continuous assessment by informing the coordinator of the subject within the established period.

If so, the evaluation will be 50% Problem solving and 50% objective test.

To pass the subject, students must have independently passed all the evaluation sections and have attended 80% of the practical classes. The non-attendance to the practices supposes the loss to the continuous evaluation.

Students who have one of the approved parts will keep the passed part for the next call within the same academic year.

2nd chance

The students can examine 100% of the subject having two tests: 50% Problem solving and 50% objective test.

To pass the subject, students must independently pass the theoretical and practical exam.

In any of the calls, if the students obtain a numerical grade greater than 5, but do not meet the requirements established to pass the subject, they will have a grade of 4.5 (failed). In case of lower grades, the grade obtained will be given.

Problem solving will account for 50% of the final grade and will consist of solving practical exercises that will be structured in two blocks and must be approved independently.

The objective test represents 50% of the final grade and will consist of a multiple choice test that is structured in two blocks and must be passed independently.

Considerations:

Students who take this subject are required to conduct themselves responsibly and honestly. Any form of fraud (i.e. copying and / or plagiarism) aimed at falsifying the level of knowledge or skill achieved by a student in any type of test, report or work designed for this purpose is considered inadmissible. Fraudulent conduct may result in the subject being suspended for a full course. will keep an internal record of these actions so that, in the event of recidivism, the opening of a disciplinary case can be requested in the rectory.

Ethical commitment:

The student must exhibit appropriate ethical behavior. In the event of unethical behavior (copying of seminars, plagiarism of work, and use of unauthorized electronic equipment, etc.) that impede the proper development of teaching activities, the student will be considered not to meet the requirements necessary to pass the subject, and in this case your qualification in the current academic year will be suspended (0.0). The use of any electronic device during the assessment tests will not be permitted unless expressly authorized. The fact of introducing an unauthorized electronic device in the examination room will be considered a reason for not passing the subject in the current academic year and the overall grade will be suspended (0.0).

Image and / or audio recording: Unless expressly authorized by the teacher, it will not be allowed to record, in whole or in part, both sound and image, the master classes, seminars or practices of the subject, in accordance with the provisions of the Property Law Intellectual, the Organic Law for the Protection of Personal Data and the Organic Law for the Civil Protection of the Right to Honor, Personal and Family Privacy and Self-Image. Depending on the subsequent use, the non-consensual recording may give rise to civil, disciplinary, administrative and, eventually, criminal liability.

Sources of information

Basic Bibliography

Gerard E. Dallal., **The little handbook of statistical practice**,

Macchi, R. L., **Introducción a la estadística en ciencias de la salud**, 3, Panamericana, 2019

Unidad de Bioestadística Clínica del Hospital Universitario Ramón y Cajal, **Material docente de la Unidad de Bioestadística Clínica del Hospital Universitario Ramón y Cajal**,

Argimón JM, Jiménez J., **Métodos de investigación clínica y epidemiológica.**, 5, Elsevier, 2019

Hernández-Aguado I, Gil A, Lumbreras B, **Manual de epidemiología y salud pública para grados en ciencias de la salud**, 3, Panamericana, 2018

Stephen Polgar, Shane A. Thomas, **Introducción a la investigación en ciencias de la salud**, 7, Elsevier, 2021

Javier Cabo Salvador, María Antonia Bellmont Lerma, Jesus Herreros Gonzalez, **Normativa ética y de calidad de la investigación biomédica**, Ediciones Diaz de Santos, 2014

Complementary Bibliography

Woolson, R. F.; Clarke, W. R., **Statistical Methods for the Analysis of Biomedical Data**, 2, Wiley, 2002

Dupont, W. D., **Statistical Modeling for Biomedical Researchers**, 2, Cambridge University Press, 2002

Michael Borenstein, Larry V. Hedges, Julian P. T. Higgins, Hannah R. Rothstein, **Introduction to Meta-Analysis**, 2, Wiley, 2021

Fernández-Crehuet J, Gestal JJ, Delgado M, Bolúmar F, Herruzo R, Serra L, **Medicina preventiva y salud pública**, 12, Elsevier, 2015

VV.AA., Fistera, **Metodología de la investigación**,

José Ramos Vivas, **Manual De Comunicación y Divulgación Científica**, 2, Almuzara, 2021

Cristina Hanganu-Bresch, Michael J. Zerbe, Gabriel Cutrufello, Stefania M. Maci, **The Routledge Handbook of Scientific Communication**, 1, Routledge, 2021

Angelika H. Hofmann, **Scientific Writing and Communication: Papers, Proposals, and Presentations**, 4, Oxford University Press, 2019

Ten Cate O., **The Ethics of Health Professions Education Research: Protecting the Integrity of Science, Research Subjects, and Authorship.**, 1;97(1):13-17, Acad Med., 2022

Miguel Ángel Sánchez González, **Bioética en Ciencias de la Salud**, Elsevier, 2021

Recommendations