



Universitat de Lleida

DEGREE CURRICULUM **BIostatISTICS**

Coordination: RUÉ MONNÉ, MONTSERRAT

Academic year 2020-21

Subject's general information

Subject name	BIostatistics			
Code	100605			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Double bachelor's degree: Degree Physiotherapy and Degree in Human Nutrition and Dietetics	3	COMMON	Attendance-based
	Bachelor's Degree in Human Nutrition and Dietetics	1	COMMON	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA		TEORIA
	Number of credits	3		3
	Number of groups	2		2
Coordination	RUÉ MONNÉ, MONTSERRAT			
Department	BASIC MEDICAL SCIENCES			
Teaching load distribution between lectures and independent student work	Classroom 60 Lectures 30 Practices and tutorials 10 Seminars 20			
Important information on data processing	Consult this link for more information.			
Language	Catalan			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BERTRAN MELINES, ALEXANDRA	alexandra.bertran@udl.cat	3	
RUÉ MONNÉ, MONTSERRAT	montserrat.rue@udl.cat	3	
SORRIBAS TELLO, ALBERT	albert.sorribas@udl.cat	6	

Subject's extra information

It is a subject of the Human Nutrition and Dietetics degree taught during the second semester of the first academic year. This course aims to introduce students into statistical methods that allow to study the phenomena where variability is an important component. Without this method, it is very difficult to generalize the results observed and determine their significance. This is the case of observational and experimental studies in the field of health sciences, where individual variability and the many factors that influence each situation makes it difficult to analyze the problem intuitively.

Learning the basics of statistical tools and their use in practical situations of interest is a key point in a nutritionist career. As a methodological tool, Statistics plays a main role in health sciences, being fundamental to professional performance based on the best scientific evidence.

In this subject we will also work general competences like use of information technology, group work, English, and oral presentations.

Learning objectives

To pass the course, students should know how to use the basic concepts of statistical method in relation to specific problems of professional activity in human nutrition and dietetics, with particular attention to the critical appraisal of the results of observational and experimental studies.

As for skills, students who pass the course should be able to:

- Identify and know the main features of the designs used in health studies.
- Perform descriptive data analyses.
- Estimate and interpret probabilities of events.
- Estimate confidence intervals in the case of a group or in the comparison of groups.

In addition, students who pass the course must achieve the following skills:

- Interpret and describe the results of a specific study using descriptive statistics tools.
- Gather information, relate it to their knowledge, synthesize and report it.
- Using a statistical software to analyze data.
- Teamwork.
- English to understand scientific literature.

Competences

Specific		Objectives	
To know the statistical methods applied to Health Sciences		1, 2	
Cross-sectional	Activities		Evaluation
<ul style="list-style-type: none"> • Teamwork • Information Technologies use • English use 	<ul style="list-style-type: none"> • Assignment work in small groups • Working at the Sakai environment and use statistical software • Read articles in English 		<ul style="list-style-type: none"> • Assignments grading • Homework

Subject contents

Chapter 1. Design of studies in Health Sciences. Introduction to research in health sciences and presentation of the fundamental role of Statistics in the research process. **Experimental design.** The clinical trial as the “gold standard” of research in health sciences. Study design. Validity of the measures. Factors that may influence the results. Randomization, blinding, intention to treat. Assessment of the effect: Primary and secondary variables. Ethical issues of experimental studies. **Observational designs.** Observational descriptive studies. Analytical observational studies. Cohort and case-control studies. Measures of frequency and association between risk factors and diseases. Relative risk and odds ratio. Advantages and limitations of observational studies.

Chapter 2. Description and presentation of data. Descriptive statistics. Type of variables. Measures of central tendency (mean, quantiles, median) and measures of dispersion (variance, standard deviation, interquartile range). Graphical representation of variables.

Chapter 3. Probability. Probability as relative frequency. Rules for calculating probability. Conditional probability. Bayes' theorem. Sensitivity, specificity and predictive values. Interpretation.

Chapter 4. Probability distributions. Theoretical probability distribution. Discrete and continuous distributions. Binomial and Poisson distributions. Normal and exponential distributions. Normality or reference intervals. Z-scores.

Chapter 5. Estimation and contrast of hypothesis. Population and sample. Sampling distribution of a parameter. Central limit theorem. Confidence intervals for means and proportions. Confidence intervals for means and proportion differences. Confidence intervals for probability ratios. Hypothesis. The null and alternative hypotheses. Statistical significance: p values.

Chapter 6. Correlation and regression. Relationship between two quantitative variables. The Pearson correlation coefficient. The Spearman correlation coefficient. The regression line. The regression model. Interpretation of the parameters of the regression model.

Methodology

During the 2020-21 academic year, computer classes, seminars and internships will be held virtually. The Virtual Campus video conferencing tool will be used. Classes will be recorded to facilitate consultation and revision of the concepts explained in class.

To achieve the objectives and acquire the competences the following activities will be scheduled :

Lectures (CM for classes magistrals)

They are intended to expose the contents and highlight those most important aspects of the use of Statistics in NHD.

Seminars (Sem)

The purpose of the seminars is for students to better understand statistical concepts and to become familiar with the applications of statistical methodology. They consist of solving exercises, analyzing data and interpreting the results.

Computer Activities (Inf)

The R statistical software and the R Studio platform will be used to analyze data from clinical or population studies. The statistical concepts presented in the lectures and seminars will be explored in depth.

Tutorials (Tut)

They will serve to answer questions and highlight those aspects of Biostatistics most applied to NHD.

Evaluation

The evaluation will take into account the score obtained in an mid-term exam (30%), an assignment that will include exercises and computer practice (20%) and a final exam (40%), which can be repeated if failed. The remaining 10% will be obtained by periodical short tests performed at the end of the theoretical classes.

To pass the course, it is necessary to pass the final exam (minimum grade of 5 out of 10) and have an average overall grade greater than or equal to 5.

Bibliography

Basic references:

Sorribas A, Abella F, Gómez X, March J. (1997) Metodologia estadística en ciències de la salut: Del disseny de l'estudi a l'anàlisi de resultats. Lleida: Edicions de la Universitat de Lleida.

The Sorribas et al. book can be downloaded from www.bioestadistica.org.

Daniel WW. (1995) Bioestadística: base para el análisis de las ciencias de la salud. México: UTEMA.

Complementary references:

Bland M (2000). An introduction to medical statistics, 3rd ed. Oxford: Oxford University Press.

Altman DG. (1990) Practical statistics for medical research. Chapman & Hall/CRC; 1st ed.

Gonick L, Smith W. The cartoon guide to statistics. HarperCollins Publishers, Inc. New York, 1993.

Addictional materials

Notes and materials that will be used during the course will be placed in the folder Continguts of Sakai.