

## Subject Outline: Research Methods II



**Course:** Master of Cosmetic Dermatology (Coursework)

**Subject:** Research Methods II: Advanced Methods - Biostatistics and Analysis

**Credit Points:** 3

**Pre-requisite(s)** Research Methods I

**Co-requisite(s):** Research Methods III

**Year/Semester Delivered:** 1/2

**Outline:**

The subject is supported by the online content/resource module “Research Methods II – Biostatistics”

This subject will expand on the concepts introduced in the Research Methods I course and deal with more advanced concepts. The broad goal is to become more confident with the critical analysis of a published paper. In addition, trainees will be embarking on a research project of their own, and therefore this course will help prepare them with a deeper understanding of research methodology.

The broad areas covered in this subject include:

- Epidemiological studies-
  - Evidence hierarchy
  - Common types of study
- Biostatistics
  - Basic stats
  - The  $p$  value
  - Types of error
  - Statistical power
  - RR and OR
- Interpreting clinical studies
  - Sample size etc.

- Bias
  - Systematic bias
  - Selection bias
  - Information bias
  - Confounding
  - Internal/external validity

Students will also be expected to prepare a research proposal for a minor project. It will need to Outline, the research question, the importance of and/or current understanding of the issue and an outline of the approach/methodology to be adopted.

### **Learning Outcomes:**

On completion of this subject students will be able to:

**SLO 1:** Demonstrate a clear understanding of the types of Epidemiological studies.

**SLO 2:** Critically analyse and effectively evaluate research papers and reports.

**SLO 3:** Demonstrate an understanding of, and ability to calculate important bio-statistical metrics including, Odds Ratio, Relative Risk, Number Needed to Treat, and Absolute Risk Reduction.

**SLO 4:** Demonstrate a deep and thorough understanding of P value and the 95% confidence interval.

**SLO 5:** Demonstrate the ability to calculate sensitivity, specificity, positive predictive value, and negative predictive value in regard to diagnostic testing.

**SLO 6:** Demonstrate the principles and application of likelihood ratios and ROC curves.

**SLO 7:** Demonstrate an ability to address problems with study design, including sample sizes, proper randomisation, intention to treat, post hoc subgroup analysis etc.

**SLO 8:** Prepare a suitable research proposal for a minor project.

### **Student Workload:**

The following extract for the ACD Academic Awards Framework Policy should be used as a guide to the minimum time a student should spend working on this subject.

“A 3 credit point subject will have a minimum of 36 hours teaching time associated with it ...” per semester.

“1CP will equate to a minimum of 2.5 hours personal study time per week for the student. Over a semester (20 weeks) this equates to 150 hours of personal study time for a 3 CP subject”.

Refer to the Masters in Cosmetic Dermatology Curriculum document for a suggested study pattern for this subject.

**Teaching:**

- Weekly F2F Lecture/Tutorials
- Weekly virtual classroom session(s) (Webinars) - Includes online discussion contribution
- Student self-paced online study

**Assessment:**

- Formal MCQs
- Written Assignment(s)
- Virtual classroom contributions

Assessment task	Weight	Subject Learning outcomes assessed	Curriculum Learning Outcomes	Due date
MCQ Exam/Quiz	30%	SLO 1 - 8	CLMO 1 - 7	TBA
Assignment 1: Research paper critiques	30%	SLO 1 - 7	CLOM 1 – 5, 7	TBA
Assignment 2: Research Proposal	35%	SLO 8	CLMO 6	TBA
Discussion/webinar Contribution	5%	All	CLMO 1 - 7	Assessed Weekly

**Recommended Additional Resources:**

- Research Methods 1 Webinar online
- Greenhalgh T. (2010) How to Read a Paper: The Basics of Evidence-Based Medicine. (4th ed.) West Sussex: Wiley-Blackwell.
- Field, A. Discovering Statistics Using IBM SPSS Statistics. Sage edge. 4<sup>th</sup> ed., 2017
- Greenhalgh T (1997) How to Read a Paper. *British Medical Journal*, July p315
- Other published papers referred to in the online supporting module.

**Curriculum Mapping:**

Subject Learning Outcome	Curriculum Learning Outcome
<b>SLO 1:</b> Demonstrate a clear understanding of the types of Epidemiological studies.	CLMO 1,3 – 4, 6 - 7
<b>SLO 2:</b> Critically analyse and effectively evaluate research papers and reports.	CLMO 3 – 5
<b>SLO 3:</b> Demonstrate an understanding of, and ability to calculate important bio-statistical metrics including, Odds Ratio, Relative Risk, Number Needed to Treat, and Absolute Risk Reduction.	CLMO 4, 6 - 7
<b>SLO 4:</b> Demonstrate a deep and thorough understanding of P value and the 95% confidence interval.	CLMO 4, 6 - 7
<b>SLO 5:</b> Demonstrate the ability to calculate sensitivity, specificity, positive predictive value, and negative predictive value in regard to diagnostic testing.	CLOM 6 – 7
<b>SLO 6:</b> Demonstrate the principles and application of likelihood ratios and ROC curves.	CLOM 6 – 7
<b>SLO 7:</b> Demonstrate an ability to address problems with study design, including sample sizes, proper randomisation, intention to treat, post hoc subgroup analysis etc.	CLOM 6 – 7
<b>SLO 8:</b> Prepare a suitable research proposal for a minor project.	CLMO 6 - 7

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