HLTH306
Research Methods for Health Sciences
S1 Day 2014
Chiropractic

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Disclaimer
Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.
General Information

Unit convenor and teaching staff
Unit Convenor
Subramanyam Vemulpad
subramanyam.vemulpad@mq.edu.au
Contact via subramanyam.vemulpad@mq.edu.au
C5C West 351
Tuesday 10 am -12 noon

Credit points
3

Prerequisites
39cp

Corequisites

Co-badged status

Unit description
This unit provides an introduction to the principles of evidence-based health practice. The unit covers a range of issues in research including: subjectivity and objectivity; different research strategies; evaluation and interpretation of data; and ethical issues. Concepts of efficacy, effectiveness, clinical and statistical significance, and critical appraisal of published work are introduced.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-dates

Learning Outcomes
1. Explain the role of research and scientific enquiry in health sciences
2. Compare relative merits of different levels of ‘evidence’
3. Explain the importance of evidence based health care
4. Critically appraise available information including published work related to health sciences
5. Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
6. Use spread sheets and Minitab for basic statistical analyses of data
7. Interpret basic epidemiological and statistical terms such as confidence intervals, effectiveness, efficacy, error, incidence, mean, median, mode, prevalence, probability, reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity
8. Demonstrate skills for self-directed learning and inquiry

**Assessment Tasks**

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical work</td>
<td>20%</td>
<td>Weekly</td>
</tr>
<tr>
<td>Assignment 1</td>
<td>15%</td>
<td>9 April 2014 (2 pm)</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>15%</td>
<td>28 May 2014 (2 pm)</td>
</tr>
<tr>
<td>Final Examination</td>
<td>50%</td>
<td>June (University Exam period)</td>
</tr>
</tbody>
</table>

**Practical work**

Due: **Weekly**
Weighting: **20%**

Exercises based on Practical sessions

This Assessment Task relates to the following Learning Outcomes:
- Explain the role of research and scientific enquiry in health sciences
- Compare relative merits of different levels of ‘evidence’
- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
- Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
- Use spread sheets and Minitab for basic statistical analyses of data
- Interpret basic epidemiological and statistical terms such as confidence intervals, effectiveness, efficacy, error, incidence, mean, median, mode, prevalence, probability, reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity
- Demonstrate skills for self-directed learning and inquiry
Assignment 1
Due: 9 April 2014 (2 pm)
Weighting: 15%
Assignment would include data analysis and interpretation as well as critical appraisal of published articles.

This Assessment Task relates to the following Learning Outcomes:
• Explain the role of research and scientific enquiry in health sciences
• Compare relative merits of different levels of ‘evidence’
• Explain the importance of evidence based health care
• Critically appraise available information including published work related to health sciences
• Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
• Use spread sheets and Minitab for basic statistical analyses of data
• Interpret basic epidemiological and statistical terms such as confidence intervals, effectiveness, efficacy, error, incidence, mean, median, mode, prevalence, probability, reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity
• Demonstrate skills for self-directed learning and inquiry

Assignment 2
Due: 28 May 2014 (2 pm)
Weighting: 15%
Assignment would include data analysis and interpretation as well as critical appraisal of published articles.

This Assessment Task relates to the following Learning Outcomes:
• Explain the role of research and scientific enquiry in health sciences
• Compare relative merits of different levels of ‘evidence’
• Explain the importance of evidence based health care
• Critically appraise available information including published work related to health sciences
• Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
• Use spread sheets and Minitab for basic statistical analyses of data
Interpret basic epidemiological and statistical terms such as confidence intervals, effectiveness, efficacy, error, incidence, mean, median, mode, prevalence, probability, reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity

- Demonstrate skills for self-directed learning and inquiry

Final Examination
Due: June (University Exam period)
Weighting: 50%

This Assessment Task relates to the following Learning Outcomes:
- Explain the role of research and scientific enquiry in health sciences
- Compare relative merits of different levels of ‘evidence’
- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
- Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
- Interpret basic epidemiological and statistical terms such as confidence intervals, effectiveness, efficacy, error, incidence, mean, median, mode, prevalence, probability, reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity
- Demonstrate skills for self-directed learning and inquiry

Delivery and Resources

Delivery mode
1. 2 hour lectures per week, weeks 1-12. iLectures are available for this unit.

2. Eleven x2 hour practicals per student, starting from week 2.

3. Four to five hours per week self-instructional learning, readings from the text and exercises on lecture topics

Class times and locations

Lecture times: 2 hrs each week starting from 3 March 2014.

Monday 8 – 10 am; E7BT3

Practicals: 2 hrs each week, as noted below, starting week 2 (10th March).

Prac Group 1: Monday 10 – 12 noon; E4B306; starting on 10th March
Prac Group 2: Monday 12 –2 PM; E4B306; starting on 10th March
Prac Group 3: Monday 2 – 4 PM; E4B306; starting on 10th March
Prac Group 4: Monday 4 – 6 PM; E4B306; starting on 10th March

You are advised to bring a USB memory stick for practical classes. Practical group allocations will be finalized in Week 1. Students allocated to one group cannot turn up for practicals meant for another group without prior approval from the Unit convenor.

- Attendance: Attendance for practicals is compulsory. Attendance at lectures is strongly recommended.

**Required and recommended resources**

**Recommended texts**

Hoffmann et al. Evidence-Based Practice Across the Health Professions. 2 Edn. ISBN: 9780729541350, Elsevier Australia.


**Further reading**

Straus, S.E et al. 2005. Evidence Based Medicine; 4 Edn; Churchill Livingstone

**Useful web-resources:**

http://www.mq.edu.au/library (Macquarie University library site; list and links to many databases and Journals)

http://www.cochrane.org (Cochrane Collaboration, the most reliable source of evidence in health care)

http://www.pedro.org.au/ (Physiotherapy Evidence Database)

Unit web page

The URL of the HLTH306 iLearn site is: https://ilearn.mq.edu.au/

You will be asked for a username and password. Your username is your student MQID. Your MQID and password have been mailed to you by the University. If you have lost them go to the student portal: http://students.mq.edu.au/home/

Any changes made since last offering: 1) Two tutors per prac class instead of the earlier single tutor per class. 2) Hoffmann et al has been added as a recommended text. 3) Minichello text book has been changed from 'required' to 'recommended'.

**Unit Schedule**

HLTH 306 List of topics by week
The topic titles are given as a guide only.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic*</th>
<th>Prac Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3/03/14</td>
<td>Scientific Method, Introduction to EBP, Clinical Epidemiology</td>
<td>No</td>
</tr>
<tr>
<td>1.</td>
<td>10/03/14</td>
<td>Study Design, Measurement and Summarising and Graphing Categorical Data</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>17/03/14</td>
<td>Summarising and Graphing Continuous Data</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>24/03/14</td>
<td>Graphing Continuous Data (continued), Populations and Samples</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>31/03/14</td>
<td>What is evidence; where and how to find evidence (Hierarchy of evidence; Health Chiro databases)</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>7/04/14</td>
<td>Research Planning and Research Designs I</td>
<td>Yes</td>
</tr>
<tr>
<td>Break</td>
<td>14-21 Apr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>28/04/14</td>
<td>Research Designs II</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>5/05/14</td>
<td>Confidence Intervals and One-sample Hypothesis Tests</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>12/05/14</td>
<td>Paired data, 2 sample hypothesis tests, tests of proportions</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>19/05/14</td>
<td>Regression, Contingency Tables and Odds Ratios</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>26/05/14</td>
<td>Research in Clinical Practice (outcome measures)</td>
<td>Yes</td>
</tr>
<tr>
<td>1.</td>
<td>2/06/14</td>
<td>Ethics, Conflict of Interest and Confidentiality in Health Research</td>
<td>Yes</td>
</tr>
</tbody>
</table>
* Dr Subra Vemulpad: Weeks 1, 5, 6, 7, 11 and 12

Dr Ken Beath: Weeks 1, 2, 3, 4, 8, 9 and 10

**Policies and Procedures**

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:


In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

**Student Support**

Macquarie University provides a range of support services for students. For details, visit [http://students.mq.edu.au/support/](http://students.mq.edu.au/support/)

**Learning Skills**

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- **Workshops**
Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

**Learning outcomes**

- Explain the role of research and scientific enquiry in health sciences
- Compare relative merits of different levels of ‘evidence’
- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
- Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
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reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity

Assessment tasks

• Practical work
• Assignment 1
• Assignment 2
• Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

• Explain the role of research and scientific enquiry in health sciences
• Compare relative merits of different levels of ‘evidence’
• Explain the importance of evidence based health care
• Critically appraise available information including published work related to health sciences
• Use spread sheets and Minitab for basic statistical analyses of data
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Assessment tasks

• Practical work
• Assignment 1
• Assignment 2
• Final Examination

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.
This graduate capability is supported by:

**Learning outcome**

- Explain the importance of evidence based health care

**Assessment tasks**

- Assignment 1
- Assignment 2
- Final Examination

**Effective Communication**

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

**Learning outcomes**

- Compare relative merits of different levels of ‘evidence’
- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
- Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
- Use spread sheets and Minitab for basic statistical analyses of data
- Demonstrate skills for self-directed learning and inquiry

**Assessment tasks**

- Practical work
- Assignment 1
- Assignment 2
- Final Examination

**Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social
justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

**Learning outcomes**

- Explain the role of research and scientific enquiry in health sciences
- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
- Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
- Demonstrate skills for self-directed learning and inquiry

**Assessment tasks**

- Assignment 1
- Assignment 2
- Final Examination

**Capable of Professional and Personal Judgement and Initiative**

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

**Learning outcomes**

- Explain the role of research and scientific enquiry in health sciences
- Compare relative merits of different levels of ‘evidence’
- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
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Demonstrate skills for self-directed learning and inquiry

Assessment tasks

• Practical work
• Assignment 1
• Assignment 2
• Final Examination

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

• Explain the role of research and scientific enquiry in health sciences
• Explain the importance of evidence based health care
• Use spread sheets and Minitab for basic statistical analyses of data
• Interpret basic epidemiological and statistical terms such as confidence intervals, effectiveness, efficacy, error, incidence, mean, median, mode, prevalence, probability, reproducibility, risk, sample size, sampling, SD, sensitivity, significance, specificity and validity
• Demonstrate skills for self-directed learning and inquiry

Assessment tasks

• Practical work
• Assignment 1
• Assignment 2
• Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:
Learning outcomes

- Explain the role of research and scientific enquiry in health sciences
- Compare relative merits of different levels of ‘evidence’
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- Critically appraise available information including published work related to health sciences
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Assessment tasks

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- Assignment 1
- Assignment 2
- Final Examination

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Explain the importance of evidence based health care
- Critically appraise available information including published work related to health sciences
- Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice
- Demonstrate skills for self-directed learning and inquiry
Assessment tasks

• Practical work
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Grading criteria for HLTH306

Achievement of grades will be based on the following criteria:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>Failure to complete all assessment tasks or unsatisfactory performance (&lt;50% mark)</td>
</tr>
<tr>
<td>Pass</td>
<td>A minimum of 50% in each assessment task</td>
</tr>
<tr>
<td>Credit</td>
<td>A minimum of 50% in each assessment task, PLUS a minimum 65% total mark</td>
</tr>
<tr>
<td>Distinction</td>
<td>A minimum of 50% in each assessment task, PLUS a minimum 75% total mark</td>
</tr>
<tr>
<td>High Distinction</td>
<td>A minimum of 50% in each assessment task, PLUS a minimum 85% total mark</td>
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</table>

Changes since First Published

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/03/2014</td>
<td>Lecture topics now include more descriptive titles.</td>
</tr>
</tbody>
</table>