HLTH306
Research Methods for Health Sciences
S1 Day 2015
Dept of Chiropractic

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https://unitguides.mq.edu.au/unit_offerings/46468/unit_guide/print
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

Lecturer
Kenneth Beath
ken.beath@mq.edu.au
Contact via ken.beath@mq.edu.au
Building E4A, room 526
Wednesday 2 - 4 pm

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://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes
On successful completion of this unit, you will be able to:

   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

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>1 April 2015 (9 am)</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>15%</td>
<td>20 May 2015 (9 am)</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

On successful completion you will be able to:

- 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: 1 April 2015 (9 am)
Weighting: 15%

Assignment would include data analysis and interpretation as well as critical appraisal of published articles.

On successful completion you will be able to:

• 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 spreadsheets 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: 20 May 2015 (9 am)
Weighting: 15%

Assignment would include data analysis and interpretation as well as critical appraisal of published articles.

On successful completion you will be able to:

• 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%

On successful completion you will be able to:
• 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 1-13. 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 23 Feb 2015.
Monday 8 – 10 am; E7BT5

Practicals: 2 hrs each week, as noted below, starting week 2 (2 March 2015).
Prac Group 1: Monday 10 – 12 noon; E4B306; starting on 2 March
Prac Group 2: Monday 12 – 2 PM; E4B306; starting on 2 March
Prac Group 3: Monday 2 – 4 PM; E4B306; starting on 2 March
Prac Group 4: Monday 4 – 6 PM; E4B306; starting on 2 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: Statistics at square one has been added as a
## 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>23/02/2015</td>
<td>Scientific Method, Introduction to EBP, Clinical Epidemiology</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>2/03/2015</td>
<td>Study Design, Measurement and Summarising and Graphing Categorical Data</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>9/03/2015</td>
<td>Summarising and Graphing Continuous Data</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>16/03/2015</td>
<td>Graphing Continuous Data (continued), Populations and Samples</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>23/03/2015</td>
<td>What is evidence; where and how to find evidence (Hierarchy of evidence; Health/Chiro databases)</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>30/03/2015</td>
<td>Research Planning and Research Designs I</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Break</td>
<td>6-13 Apr</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>20/04/2015</td>
<td>Research Designs II</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>27/04/2015</td>
<td>Confidence Intervals and One-sample Hypothesis Tests</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>4/05/2015</td>
<td>Paired data, 2 sample hypothesis tests, tests of proportions</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>11/05/2015</td>
<td>Regression, Contingency Tables and Odds Ratios</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>18/05/2015</td>
<td>Research in Clinical Practice (outcome measures)</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>25/05/2015</td>
<td>Ethics, Conflict of Interest and Confidentiality in Health Research</td>
<td>Yes</td>
</tr>
<tr>
<td>13</td>
<td>1/6/2015</td>
<td>Revision</td>
<td>No</td>
</tr>
</tbody>
</table>

* Dr Subra Vemulpad: Weeks 1, 5, 6, 7, 11, 12 and 13

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

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


The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.

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/)

**Results**

Results shown in iLearn, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

**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
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

**Student Services and Support**

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.
Student Enquiries
For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help
For help with University computer systems and technology, visit http://informatics.mq.edu.au/help/.

When using the University’s IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

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
• Practical work
• 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
Explain ethics, confidentiality, conflict of interest and related issues in the context of research and clinical practice

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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 spreadsheets 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
Discipline Specific Knowledge and Skills

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
- Use spreadsheet 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

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’
- 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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- Demonstrate skills for self-directed learning and inquiry

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
- 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

**Assessment tasks**

- Practical work
- 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**

- Practical work
- 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
- Assignment 1
- Assignment 2
- Final Examination
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>
</tr>
</tbody>
</table>