**REHB 5072 (ver2009 Human Movement)**

RESEARCH FOR HEALTH PRACTICE

Study guide

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**Note:**

Search for this course's home page at <http://www.unisanet.unisa.edu.au/subjectinfo/>

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| WelcomeWelcome to the course Research for Health Practice. This course is an introduction to the fundamentals of research and evidence based practice as they apply to health practice. You will explore how research can contribute to the development of a knowledge base and how you might use research approaches to answer questions that arise in your practice. Although research draws upon a unique body of knowledge, there are many similarities between the research process and the practice skills you have been developing in your studies. Tasks such as framing questions, exploring the literature, interviewing people, recording your observations, synthesising and interpreting information and drawing conclusions will already be familiar to you.Being a competent practitioner includes the engagement in lifelong learning. We hope that by participating in this course you will develop some tools to do this, as well as gain a sense of enthusiasm for the ways in which research can contribute to your professional practice. I hope you enjoy this introduction to research and evidence-based practice – I look forward to working with you through the modules both on-line and during class.**Carolyn Murray****2008 Course Coordinator****2009 Course Coordinator to be advised.** |

# Information on the use of the online learning resources and discussion forums in Research for Health Practice

Kobie Boshoff

Revised Alison Lane 2007

## Access and orientation to the website:

The course website is located at the following Internet address:

<http://www.unisanet.unisa.edu.au/Courses/course.asp?Course=100096>

Follow the link to Online Learning.

You will be asked to enter your password to gain access to the site.

Contact the IT helpdesk if you are having problems accessing the site: Telephone 8302-5000 or e-mail [helpdesk@unisa.edu.au](http://www.unisa.edu.au/misc/phonebook/sendmail.asp?sendto=helpdesk@unisa.edu.au)

The page that opens up is the course webpage. The modules are indicated on the left hand side, with discussion rooms indicated by the “people chatting” sign. The quizzes have “?” signs. You will also find an electronic version of the CIB & study guide online.

## What are online discussions? How will we be using online discussions during the course?

On-line discussion forums provide a common meeting place on the Internet for participants to contribute information. Communication occurs by means of posted messages, which appear in the form of a threaded discussion. Messages are grouped under the same topic heading which makes it possible to follow the different topics within a discussion. On-line discussion in this course occurs mainly via asynchronous discussion (discussion which does not occur simultaneously with other participants). This means that participants are not present on-line at the same time. Participants can however arrange to be present at the same time, but this conversation differs from a synchronous on-line chat, were the software allows for a rapid exchange of messages between participants. During on-line conferencing, topics are arranged for intensive discussion during certain periods.

The main advantage of on-line discussion is the independence of time and travel which are required of face-to-face discussions. Participants can contribute to the discussions any time that is convenient to them. They can access the discussion from anywhere where they can obtain Internet access.

## Tips on how to use the on-line discussion forum:

It is suggested that participants enter the site at least 2/3 times a week, but of course, the more participation occurs, the more it will facilitate a lively discussion. This will also minimise the occurrence of information overload, which occurs when a participant needs to read through days of threaded discussions.

Studies with students who have participated in on-line discussion groups have indicated that the quality of a discussion depends on the students’ independence in entering and participating in the discussion. No structure is provided as is in face-to-face discussions. Some students suggest that participants should plan the times they have available to access the site ahead of time and schedule it into their diaries.

When contributing to the discussion, participants have the choice of either composing a new topic for discussion or replying on someone else’s contribution. When starting a new topic, click on the “new message” button at the top of the screen. It is required that you supply a topic heading for your message. When selecting a topic heading, take care to provide one which is clear, specific and to the point. After typing your message in, read through it again and make sure that it represents accurately what you intended to say. Once the “submit” button is clicked, no changes can be made to the message.

When replying to someone else’s topic, click on the message you want to reply to, then select the “reply” button on the screen. Type in your message, double check it and click the “submit” button.

Because on-line discussions are different than face-to-face discussion groups, the following tips are provided:

* On-line discussions have the disadvantage of not providing emotional content and non-verbal responses to a conversation. Try to include these by using terminology like: “Humorous!”, “Surprised” and “Exciting!”.
* Take care before submitting your message that the tone of your message is representative of what you mean to say. Without the emotional and non-verbal clues, a message can easily sound cold, formal or directive.
* Also ensure that your message will be understood in the correct context by others.
* Keep messages to individual students minimal – rather e-mail individual students. The discussion page is meant for issues related to all students and can easily become cluttered.

Some find it difficult to follow the discussion on a computer screen and it may be useful to print out the messages first and take your time to respond to them.

In order to ensure that all technical problems are sorted out before the first discussion begins and to familiarise all participants with the site, it is requested that all students enter the site before our first face-to-face tutorial.

After entering the site, leave your first message by responding to my e-mail in the discussion room for Module 1 – the welcome activity.

## Making on-line learning and discussions a success:

* Checking hardware, software and access beforehand
* Plan ahead: follow course schedule and keep on top of work each week
* Some students prefer keeping hard copies of work online
* Keep discussion rooms uncluttered and neat by carefully selecting appropriate headings and replying to the correct messages
* Checking discussions 2/3 during the week
* Some students find booking time into their diaries for online participation to be helpful
* Use e-mail, phone or face-to-face visits with tutor as communication when it is re individual student aspects. Use online discussion forum for issues which relate to or will benefit all students.

Happy chatting!!

Kobie Boshoff

Alison Lane

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| Module 1.1 What is research?Background to ResearchWelcome to Research for Health Practice! We hope that this will be the beginning of an interesting and enjoyable journey to become a critical consumer of research, and an evidence-based practitioner. You may already have had positive experiences of research. Or perhaps you have read or heard about research in ways which made it seem dry and distant from the skills and information relevant for health care practice. The teaching team for this course have positive views about and experiences of research. We believe the research knowledge and skills you can develop in this course will equip you to be a more effective clinician in the future. A recurrent theme within this course is *Evidence Based Practice (EBP)*. You will learn what it is and how to conduct your own EBP review.The material and activities contained in this first module are designed to give you an overview of what research is and why it is relevant to you. In this module you will explore issues such as the different terminology used in describing research, and give you some background on the multiple approaches available for conducting research. The difference between research and practice questions will be discussed, and you will have the opportunity to hear from local health care professionals about their experiences in *using and doing* research. The importance of researchImagine you are working as a therapist in an outpatient hand clinic and one of your clients, who has had a recent hand injury, seems reluctant to wear a dynamic splint on her hand. You know that the dynamic splint is designed to protect and assist in controlled motion of her digits during healing, but you wonder whether there would be any difference in her outcome if she wore a static resting splint instead. In this situation your ability to search and critically analyse the research literature will be very valuable. You find some research evidence that, in people with similar hand injuries to your client, the outcomes for the dynamic splint design are superior. This information enables you to discuss with your client the benefits of this treatment and why it is important. You discuss with your client her concerns about the dynamic design, and agree to work together to come up with a splint that suits her needs and also serves the therapeutic goals. As illustrated by this example, increasingly research knowledge is being used to guide and inform clinical practice. Developing a solid understanding of research is an important foundation to enable you to evaluate the merit and relevance of research to your clinical practice. Acquiring and understanding of research designs and methods is also the first step in preparing you to gather and interpret data in your future practice. This course should help you to develop your research knowledge and skills in the following ways:* Help you to become a critical consumer of research literature;
* Develop your understanding of the value of examining your own intervention efficacy and the ways in which this can be done;
* Develop your skills to engage in evidence-based practice;
* Begin to develop your skills to participate in the research process yourself.

What is research?Research is about ways of understanding things which we observe and experience, and seeking answers to questions. As health workers, we can rely on a number of strategies for achieving understanding and answering questions. We may rely on the wisdom of others, on traditional knowledge, our own intuition or trial and error. However, more rigorous ways of developing knowledge can assist us to understand and improve the basis for our practice, examine the efficacy of our services and confidently answer practice questions.Research can be described as a *systematic* way of thinking and developing knowledge to answer a research question by *collecting and analysing data.*The research process is characterised as being*“logical, understandable, confirmable”* and generating *“useful”* information (DePoy & Gitlin, 2005, pp.6). Reading 1.1 has been provided at this stage to give you an overview of the research process. At this stage it is also useful to consider what you understand to be research.Colloquial versus scientific use of the term ‘research’When thinking and talking about research, it is important to differentiate between the colloquial use of the word and the scientific endeavour. The word ‘research’ is sometimes used colloquially to describe the process of gathering information or finding out about a particular topic. For example, consider if you were planning a holiday trip to Bali and you were unsure what to see and do while you were there. In this instance you may ask yourself a practical question:‘*How should I spend my time during my two-week holiday in Bali?’*In order to answer this question you may choose to do some ‘research’ by speaking to a travel agent, borrowing some books from the library and searching the Internet. This sequence of activities *does not* constitute the *scientific endeavour* of research, but your way of practically going out to find some information. Here you are not collecting research data and analysing it to answer a research question. If your were to take a research approach to understanding the topic of holidaying in Bali, you would need to frame a more specific research question, one which could be answered by systematically gathering and analysing data. For example, you could ask *“What has been the experience of people taking two-week* *holidays in Bali?”*You could develop a survey, or interview people who had that experience, analyse their responses and summarise your findings. Whilst this information would not directly answer your above practical question of where you should spend your time in Bali, it would provide you with some evidence of other people’s experiences whilst on holiday there. It would also give you some direct evidence to compare with the information you may have gathered from guidebooks and travel brochures. This may help you to decide on your itinerary.Required Reading 1.1Leedy, P.D. & Ormord, J.E. (2005) Practical Research Planning and Design. Pearson Merrill Prentice Hall, New Jersey.Further Reading DePoy, E. & Gitlin, L. 2005, ‘Ch 1 Research as an important way of knowing’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.**☻ Activity 1.1A *Reflection on what research means to you****Spend some time thinking about what research means to you. Brainstorm and write down some words or sentences that describe:* * *What you believe research is;*
* *Your expectations about research and this course;*
* *Any previous exposure you have had to research.*

*Share your thoughts on these aspects in the online discussion room for Activity 1.1 A. Remember to check back later and add to the contributions of other students.***☻ Activity** **1.1B** ***Identifying the steps of the research process in a published article****Read through the abstract provided in the readings* Fleming, S., Hardman, A. Jones, C. & Sheridan, H. (2005) ‘Role Models among elite young male rugby league players in Britain’, European Physical Education Review, 11 (1), 51. (abstract only)*Identify the steps in the research process as provided by Leedy & Ormrod (2005).**You will find the answer for 1.1B online at the end of the week.* |

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| Module 1.2 - Using and doing research as an health practitionersIn the current climate of rapidly changing health knowledge and the expectation for clinical practice to keep abreast of the best available evidence, it is important that health practitioners develop a good understanding of the research process in order to utilise published research findings. This will equip you to become an effective consumer of research, and make appropriate decisions regarding the applicability of research findings to your practice setting. Furthermore, it will provide you with core skills to assist you to participate in conducting research in the future. Whilst this concept of being able to use and conduct research seems to be a reasonable expectation, you may be surprised to hear that this has not always been the case in health care and human services. In fact, this expectation is relatively new (i.e. within the last decade). Historically, knowledge about using and doing research has not been a predominate focus of health care education. However, in the current health care climate, research is rapidly rising high on the agenda for the profession, and is critical to its future development and strength. Be prepared to take this knowledge and skills out with you on Field Practice and share with your colleagues.**☻ Activity** **1.2A** ***Getting a perspective on research from occupational therapy clinicians****Some excerpts from interviews with local occupational therapists about using and doing research have been prepared for this module. Read the transcribed interviews* ***(Appendix I)*** *and make some notes about what you learn from their responses to the questions asked (listed below).* *What are your own thoughts about the perspectives they have presented?*1. *Which two words describe how you feel about research? Explain your choice?*
2. *Tell me about your involvement in research?*
3. *How have you developed your research abilities?*
4. *What skills and knowledge are important for research?*
5. *What is the value of research to health care?*
6. *What are the limitations of applying research to your practice?*
7. *What does evidence-based practice mean in the context of your clinical practice?*
8. *What is your understanding of the relationship between research knowledge and evidence-based practice?*

**☻ Activity 1.2B Read the following scenario and use as the prompts to reflect on its application in scientific research**From: Patton, M.Q. 1990, *Qualitative Evaluation and Research Methods*, Sage Publications, London.There was once a man who lived in a country that had no fruit trees. This man was a scholar and spent a great deal of time reading. In his readings he often came across references to fruit. The descriptions of fruit were so enticing that he decided to undertake a journey to experience fruit for himself.He went to the market and asked everyone he met if they knew where he could find fruit. After much searching he located a man who knew the directions to the country and place where he could find fruit. The man drew out elaborate directions for the scholar to follow.With his map in hand, the scholar carefully followed all of the directions. He was very careful to make all the right turns and to check out all of the landmarks that he was supposed to observe. Finally, he came to the end of the directions and found himself at the entrance to a large apple orchard. It was springtime and the apple trees were in blossom.The scholar entered the orchard and proceeded immediately to take one of the blossoms and taste it. He liked neither the texture of the flower nor the taste. He went to another tree and sampled another blossom, and then another blossom, and another. Each blossom, though quite beautiful, was distasteful to him. He left the orchard and returned to his home country, reporting to his fellow villagers that fruit was a much overrated food.Being unable to recognise the difference between the spring blossom and the summer fruit, the scholar never realised that he had not experienced what he was looking for.* + From Halcolm’s Evaluation Principles, cited in Patton (1990).
* Do you believe the conclusion that was drawn by the scholar and reported to his fellow villagers? Having had experience with fruit yourself, I assume your answer would be no. If so, why do you not believe him?
* If this scholar should publish his finding, what types of questions would reading about it arise with you?
* Can you make suggestions on how this scholar could have made his finding more credible?

*Share your answers to these prompts online in the discussion room for Activity 1.2B. Remember to check back later to read the contributions of others and add to the discussion.***Welcome to your first taste of Evidence- based Practice!** |
| Module 2.1 - How is research conducted?You will find that specialised terminology is used to discuss and describe research, and there appears to be no single consistent approach to describe the major research orientations across textbooks and published articles. Don’t be put off by these differences, as you will come to recognise them in time. You have been provided with a Glossary of Terms in Appendix 2, which may assist you with becoming familiar with the most commonly used terms. The table below lists the common terms used in relation to the two major directions in research. Note, the terms within each column are often used interchangeably.Terms used to describe the two major research orientations

|  |  |
| --- | --- |
| Empirical / empiricistExperimental-typeQuantitativePositivist | NaturalisticQualitativeInterpretive |

Multiple strategies available for conducting researchThe ways in which different people go about research vary, depending on the type of research question they want to answer and their beliefs and assumptions about how knowledge is developed. Over the last decade, there has been a broadening of research activity and approaches used within health care literature, drawing on both naturalistic and empirical designs. As such, the field of health care has developed an eclectic approach to research, acknowledging the advantages and limitations of both designs.You may, however, come across people from other disciplines that closely align themselves with a particular approach to research. Their choice of research approach will be closely related to their philosophical foundations and their view of the world and how knowledge should be gained. It is important to recognise that there will be these differences in how research is conducted. This makes it all the more important for you to become familiar with the multiple strategies available, their advantages and disadvantages, and when they are most appropriate to use. Ultimately, your research question, what you want to find out, and the level of theory or knowledge in the area should guide the choice of research approach.**Integrated** approaches refer to “selecting and combining designs and methods from both traditions so that one complements the other to benefit or contribute to an understanding of the whole” (DePoy & Gitlin, 2005, pp. 28). In the example from page 25 of DePoy and Gitlin (2005) discussed earlier, the researcher using an integrated design chose to study the perspectives of the participants in group therapy as well as from the perspective of existing theory as measured with a standardised outcome measure. Some researchers would argue that the integration of naturalistic and empirical designs is problematic due to the significant differences in the philosophical underpinnings of both approaches. However in healthcare disciplines, there has been growing acceptance and recognition of the inherent strengths and weaknesses of both approaches. Furthermore it is thought that the type of approach, whether integrated, naturalistic or empirical, should be **intimately related to** and **justifiable** in relation to the **type of research question to be investigated**. Therefore the choice should be a **pragmatic** one. |
| Module 2.2 How do we build understanding of issues through research?Over many centuries, philosophers, researchers and practitioners who apply knowledge have considered the question of how knowledge is developed. Within scientific fields including health, debate about the development of knowledge reflects different stances on the concepts known as ‘epistemology’ and ‘ontology’. **Epistemology** is the study of **how knowledge is understood, generated and accepted as genuine**. “It encompasses how one identifies problems, seeks answers, and holds beliefs about how one gets information” (Bullock, 1993 pp.26). **Ontology** is concerned with the **understanding of the nature of reality**. Ontological questions are therefore concerned with the nature of reality, and these considerations impact on how one goes about the research process.Therefore, your own epistemological and ontological stance will influence and ultimately determine how you operate in the world, how you view and frame problems, how you ask questions and how you seek answers. Think about the following: you are a researcher, investigating the phenomenon of snow. You decide to ask people the following question: “what colour is snow?” You select participants randomly from all over the world. Mostly you get the answer “white”, but you have also included a number of Eskimos. They however, laugh when you ask them this question and are unable to answer you. You see, to an Eskimo, there are various types of snow and they distinguish between different conditions of ice and snow. Can you see how each person’s own perspective, stance and background influences the way they perceive the world? Now don’t feel concerned if you don’t fully understand the terms epistemology and ontology. At this point it is useful for you to have some insight into the ways in which understanding about issues is developed and how knowledge development can be influenced by these perspectives. More important for you to recognise is the different stances taken by empirical and naturalistic approaches to research. These are summarised in the table below.

|  |  |  |
| --- | --- | --- |
| **Approach** | **Epistemology** | **Ontology** |
| Empirical | Knowledge is impersonal and objective. The researcher thus takes the stance of independent observer  | A realist perspective is taken. Reality exists independently of the observer |
| Naturalistic | Knowledge is subjective and should be experienced to be understood. The researcher therefore has close contact with the people, situation and phenomena under study  | A position of relativism is taken. Therefore realities (not one single reality) exist in the form of multiple mental constructions dependent on the people who hold them |

Reading 2.1 contrasts the major philosophical differences and assumptions between the two major approaches. Table 3.2 on page 36 is particularly useful in delineating the purposes and knowledge obtained from either approach.Required Reading 2.1DePoy, E. & Gitlin, L. 2005, ‘Ch 3 Philosophical foundations’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis, pp 23 – 26, 32. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Module 2.3 - What approach do health practitioners align themselves with?The type of research approach taken (empirical or naturalistic), depends on the type of research question under investigation. You may also find that some disciplines are tolerant and accepting of both approaches to research, others have a preference for either one. As such, some researchers may only acknowledge one type of approach. The example given by DePoy and Gitlin (2005) on page 25 illustrates how three researchers, who have very different epistemological philosophies, choose to study the benefits of group therapy. In reading this example, it should be clear to you that these researchers would develop quite different research questions and methodologies as a result of their chosen approach (either empirical, naturalistic or an integrated design).The following table is adapted from Bullock (1993) and may help to further clarify the differences between the empirical and naturalistic approaches.**Differences between empirical and naturalistic approaches**

|  |  |
| --- | --- |
| **Empirical** | **Naturalistic** |
| Singular reality driven by natural laws. Research aims to discover the true nature of reality and how it works | Knowledge is a human construction and exists in multiple interpreted realities |
| Objectivity is sought and is important to minimise observer bias | Objectivity is not relevant. Subjectivity is sought |
| Aim is to confirm knowledge | Aim is to generate knowledge when little is known about an area |
| Hypotheses are constructed and tested | Research ideas are documented and continually revised |
| Methodology is set before commencement of data collection | Study method is emergent and adjusted throughout the data collection process |
| Deductive reasoning is used | Inductive and abductive reasoning is used |
| Context (environment) is controlled by the researcher to minimise the influence of confounding factors and to enhance generalisation to a wider population | The natural context under which the phenomena of interest exists is critical |

 Further Reading Bullock, C. 1993, ‘Ways of knowing: the naturalistic and positivistic perspectives on research’, *Research in Therapeutic Recreation: Concepts and Methods*, Eds. M Malkin & C Howe, Venture Publishing Inc, Philadelphia.**☻ Activity 2.4A Exploring your own stance on epistemology and ontology**To consolidate your understanding about epistemology and ontology, consider the following question about the controversial topic of making birth control measures more easily accessible to teenagers in an attempt to minimize unwanted teenage pregnancies: ‘*Should teenagers be given access to condoms and other birth control measures?’**Take a blank sheet of paper and brainstorm your understanding, beliefs and opinions about this statement.* *Take another blank sheet of paper and construct a mind map of your own response to this question. In the centre of the page, write your considered response to the question, your view of the ‘truth’. Use the rest of the page to show the sources of knowledge or evidence on which you have based your response to the question. (Refer to your brainstormed list to help you complete the mind map).**Consider the following questions:** *How do you know this reality or truth?*
* *Is your knowledge gained from a values/ beliefs-based position and therefore a more subjective position? Or is it based on a more objective position, eg the number of unwanted pregnancies; costs to the government, etc.*
* *What types of information most influences or convinces you of this reality?*
* *Is some information missing, making the view inconclusive?*
* *Is there conflicting information? From what sources?*
* *If you were trying to convince someone else of this reality, what information would be most valuable to have to persuade him or her?*

*Consider what your mind map tells you:** *What approach did you take to this activity – for example, did you read up, talk to others or did you mostly reflect on this by yourself?*
* *What type of evidence is more credible to you – statistical, structured data and/or qualitative, life stories, values based?*
* *So can you identify what your stance is on the nature of reality (ontology) and the ways in which knowledge is understood, generated and accepted as genuine (epistemology)?*
* *As you work though this study guide and the various articles, it will be interesting to reflect on whether you place a higher emphasis on either one of these approaches (empirical, naturalistic or integrated) as a way of understanding the truth..*

*Share and discuss these thoughts with co-students in the online discussion room for Activity 2.4 A.* |

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| Module 3.1 - Research questionsIn the previous modules, we characterised research as the process of asking questions followed by the systematic gathering of information to generate knowledge and answers. It may seem self evident to say that the research question is critical to any research. However, it is useful to consider the ways in which the research question influences the research process. Typically, a researcher will formulate a research question when she or he first begins to plan a study. Although the question may later be changed and refined, the question provides direction for planning of the research.Well before data gathering begins, the research question provides the boundaries which can be used to conduct a literature search. As you will explore further in this module, the question will also provide some clues about the types of research designs that could be considered for a study. The question also identifies the phenomena or variables which will be studied, thus helping to clarify what sorts of outcomes or information will need to be gathered. Later in the research process, the question will be used to determine the most appropriate strategies for data analysis. Finally, the researcher will refer to the question when interpreting and reporting the findings of the study.In this module, you will become familiar with different types of research questions, and their links to different research designs. You will also get some practice posing research questions of your own.Practice questions and research questionsResearch often evolves from ideas or questions which arise in practice. Some examples of practice questions are ‘*which assessment tool should I use to evaluate how my client is progressing with intervention?*’ or ‘*which treatments are the most effective for dealing with this sort of clinical problem?*’ Practice questions can be answered in a variety of ways such as considering your own or colleague’s experiences, or by considering the applicability of research findings to your clients and setting. Practice questions differ from research questions because they pertain to your own specific situation and cannot be answered by collecting, analysing and reporting on research data alone. They incorporate a component of clinical judgement and generalisation to your own situation. However, these same questions can be modified to become questions that are researchable. For instance, you might chose to study the following research question ‘*what assessment tools are currently being used by physiotherapists to measure improvement in balance following treatment?*’ This is a descriptive research question that could be answered by surveying or interviewing physiotherapy clinicians about their current assessment practices. Constructing research questionsResearch is about answering questions, therefore the starting point for you in developing your research skills is to learn **how to construct a research question**. In later modules we will learn how people go about answering these research questions.In order to construct a research question, you first need to focus on a topic of interest and gradually refine it down to something specific and answerable. When writing research questions it is often useful to ask yourself:* What is the problem or issue that I think needs a solution?
* Why is this important?
* Who has experienced or been affected by this issue?
* Do others also think this is a problem / issue?
* What do I really want to know?
* Is this problem or issue too big for me to answer?
* Can it be sub-divided into smaller components?
* What are my predictions or guesses about what I would find?
* How might I go about testing this idea?

You also need to think about the following elements which may be included in the phrasing of the question:1. **Who/what** will I be studying? (describes sample/subjects/focus of the study);
2. **When/where** will I be researching this issue? (describes the context and properties of the issue);
3. **How** will I research this issue? (describes the method, procedures and equipment).

An example of a research question which has the first two of these elements is:“What factors predict the non-use of equipment recommended by occupational therapists **(what)** to clients attending a hospital pre-admission clinic **(who** and **where)** prior to a total hip replacement?”Developing a research question is an early step in the research process. However, researchers will often continue to refine their research questions while they are engaging in other parts of the research process. The development of a specific question is very important since it provides direction and focus to the research project. The following dialogue between a research supervisor and student illustrate this aspect (adapted from Patton, 2002)Student: “Professor, for the last four years I’ve been struggling to define my research problem, but it still seems too fuzzy.”Supervisor: “Sounds like it’s time to take it to the next level. Fuzzy methods.”Reading 3.1 provides a good introduction into the ways to begin formulating research questions (for empirical designs) and queries (for naturalistic designs). Particularly useful is Table 7-1 on page 68, which depicts the types of questions that lend themselves to empirical research designs. DePoy and Gitlin (2005) refer to level 1, 2 and 3 questions which all differ in their purpose and level of abstraction. Level 1 questions are descriptive, level 2 are relational and level 3 questions examine cause-and-effect relationships between variables. The notion of hypotheses is also highlighted in this reading, and some examples of directional and non-directional hypotheses are provided in Table 7-2 on page 70. Make sure you are comfortable with these concepts before moving on. The idea that research queries are a little broader for naturalistic inquiry is also introduced. A brief overview of three common naturalistic approaches is given: ethnography, phenomenology and grounded theory and the difference in focus of the research query is formulated for each. Required Reading 3.1DePoy, E. & Gitlin, L. 2005, ‘Ch 7 Formulating research questions and queries’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.The process of writing research questions is **closely linked with the research approach to be taken**. A research question, which lends itself to empirical designs, is more likely to be specific and related to one or more hypotheses or predictions of what you expected to happen. In contrast, a research query that lends itself to naturalistic inquiry is more likely to be broader and be more exploratory in nature.**☻ Activity 3.1A Recognising research questions and queries**Some examples of some research questions/queries are given below. See if you can recognise if they lend themselves to naturalistic (N) or empirical (E) approaches. Write your best guess adjacent to each question. Now enter your answers in the online quiz to obtain the correct answers.* How do women experience the birth of a stillborn child?
* What is the experience of chronic disability?
* What is the effect of different cushioning devices on subtalar joint motion during walking?
* What is the meaning of caring for an elderly relative?
* What factors influence the results in management of extensor tendon repair of the hand?
* What is the incidence of false positive results with Down’s syndrome antenatal screening tests?

If you still feel apprehensive and a little unsure about writing and critiquing research questions, it is useful to review the following. This has been developed to help you check whether all of the necessary elements are included in your research question. It also helps you avoid some common pitfalls.Checklist for writing effective research questions* A single question is identified
* The question is brief and to the point, using as few words as possible
* The question is grammatically correct
* The question clearly identifies the **variables** or aspects of the problem that will be explored
* The question identifies the **participants** with which the exploration will be undertaken
* The question identifies the **context** of interest
* The question is open-ended, rather than closed-ended. A closed-ended question is one that can be answered with a yes or a no. For instance, the stem “Is…..?” usually results in a yes/no response. “What is…..?” leads to greater detail
* The question doesn’t presume or set out to prove a particular answer.
* The question has the potential to be answered by collecting, analysing and interpreting data
* The scope of the question is not too broad, and is of achievable size. To check this, ask yourself, *could I make a start on this*? Does it daunt you? For instance “What is the cure for cancer?” is far too broad
* The question is important enough to be worth answering

**Activity 3.1B Critiquing a research question**Check your understanding of the characteristics of a research question by using the table above to critique the following question:*“How does social skills training enhance the functioning of people who have schizophrenia?”** Make a note of the deficiencies of this research question as it is currently stated. Write your answers in the online activity set up for this purpose & you will then be able to compare your answer with the tutor’s answer.
* In what ways might the research process be influenced if the researcher tried to go ahead with this question in its current form?
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| Module 3.2 - Writing research questions☻ Activity 3.2AHopefully now you are feeling more confident about research questions. To consolidate your learning so far, identify an area of curiosity to you that relates to student life at UniSA. Write a topic of interest to you in the table provided.

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| ***Topic:*** |
| ***Level:*** | ***Stem:*** | ***Possible questions:*** |
| *1* | *What is……?**What are…..?* |  |
| *2* | *What is the relationship……?* |  |
| *3* | *Why……..?* |  |

*Now thinking about the different levels of questioning identified by DePoy and Gitlin for empirical studies, brainstorm as many research questions as possible in relation to your topic and write them in the table. Share your questions with other students in the online discussion room for Activity 3.2A. Remember to check back later and comment on other students’ examples.* *Remember the levels: 1 (descriptive), 2 (relational) and 3 (cause-effect). Write as many questions about your topic in the table.* *Also, try to write down some empirical questions and some naturalistic questions.**Look back at the examples in the boxes on pages 66 - 67 of DePoy and Gitlin (2005) if you need help. Don’t forget to critique your research questions using the checklist provided earlier.* |

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| Module 4.1 - Empirical research designsBackground to empirical research designsIn the last module you learnt how to recognise and write research questions (i.e. descriptive, relational and cause-and-effect) suitable for empirical research designs. These research designs, which we will cover in greater detail in this module, have long been used in health care and occupational therapy research. They are based in empiricism, rely largely on deductive logic and analysis, and emphasise the importance of objectivity, precision and replication in order to discover the ‘truth’ about phenomena. Researchers using empirical designs seek to understand phenomena by counting and measuring numerical data. For example the number of older adults experiencing a fall or the numerical score achieved by groups of adults on a quality-of-life scale. The data are then analysed using quantitative methods and statistics. In this module, an overview of the main types of empirical research designs and their important features will be discussed. It is important that you understand the different approaches to empirical research because a substantial proportion of health care literature that you will come across utilises empirical research designs. Your ability to appraise the quality of studies using these approaches and their relevance to the clinical environment are dependent on your understanding of these features.Common features of all empirical research designsBefore we begin to discuss the various different types of empirical designs, it is useful to know what are the common or unifying features of empirical designs. As discussed in earlier modules, the emphasis of empirical research is on objective measurement and the purpose is to discover, or confirm the truth about phenomena. These designs are concerned with hypothesis testing and the collection and analysis of numeric data. Generally the *sample sizes* (numbers of participants) are reasonable large (except in single case designs). They are selected so that the results seen in the study sample are likely to hold true for the larger population. Some other important features of these designs include the following:* The research questions tend to be very specific;
* The investigator attempts to maintain objectivity;
* Data collection and analysis tend to be linear;
* Design, data collection strategies, tools and analysis are determined in advance;
* Standardised instruments or measures may be used;
* Data are collected and/or coded in numeric form;
* Data are generally analysed deductively.

Empirical research designs are typically used to describe phenomena (Level 1 questions), explore relationships between variables (Level 2 questions), and to examine the causal relationships between independent and dependent variables (Level 3 questions).Some examples of questions which might be investigated using an empirical research design include:* What is the effect of moderate exercise for 30 minutes a day on the Body Mass Index of moderately overweight adults?
* What is the impact of a client-centred education program on the functional ability demonstrated by people with rheumatoid arthritis?
* What are the reasons for non-attendance by clients referred to podiatry outpatient services?
* What is the relationship between mentoring from experienced health care practitioners and the skill development of newly graduated health care practitioners in a rehabilitation unit?

As outlined earlier, there are several different types of empirical research designs. These designs address three important criteria to varying degrees: randomisation, manipulation and control. These terms refer to critical features of empirical research designs and it is important that you gain an understanding of each of them:**Randomisation** refers to both the way that participants (or subjects) are selected for a study and to the process in which they are allocated to groups. The term ‘random’ means that it occurs by chance. Random assignment increases the likelihood that groups are equivalent at baseline (i.e. before variables are manipulated), but does not guarantee this.**Manipulation** refers to when one or more variables in a study are changed in some way and the effect studied. For example, client groups may receive different types of treatment or delivery over a different timeframe. In this way, provision of client care (the *independent variable*) is being manipulated and its effect upon other (*dependent*) variables is studied.**Control** refers to our ability to examine the effects of manipulation. When measuring these effects, the investigator seeks to ensure that all other variables are held constant between the groups of study participants. For example, if a researcher is interested in comparing the effects of a new treatment and a traditional treatment (treatment is the independent variable), she or he will attempt to ensure the study groups are identical in all other respects apart from this. Any difference in outcomes (dependent variables) can then be attributed to the difference in treatment and not other factors or *confounding variables*. In some circumstances, *a control group* of participants receive no treatment at all. A control group is used to enable the researcher to examine whether there has been an effect on participants simply because they have been involved in a research study. The tendency for people to behave differently just because they are being studied is called the ‘Hawthorne effect’ or sometimes called the ‘halo effect or attention factor.DuPoy and Gitlin (2005) identify the following 4 commonly used empirical research designs:1. True-experimental
2. Quasi-experimental
3. Pre-experimental
4. Non-experimental
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| Module 4.2 - Types of Empirical DesignsTrue Experimental designsTrue-experimental research designs are often referred to as the ‘gold standard’ or ideal models for empirical research, however, it is important to remember that the selection of research design should always be matched to your specific research question and to the amount of theory and information that is already known about the area of interest. Under some circumstances, true-experimental research designs may not be appropriate. For instance, if very little is known about a particular phenomenon, it is inappropriate to proceed to an experimental design. Instead a descriptive or more exploratory approach would be more useful to elucidate and describe the phenomenon.True-experimental designs should be used when you want to investigate the causal relationships between independent and dependent variables, that is, you have a level 3 research question (remember back to module 3!). Questions about the effectiveness of interventions are commonly investigated using true-experimental designs to determine whether a particular treatment causes a change in outcomes / symptoms. This type of research is conducted when substantial information is already present describing the phenomena of interest and how it behaves in relation to other variables. True-experimental designs offer the greatest degree of control and minimise bias that will affect research findings. In these designs, participants are randomly assigned to the study and/or groups, a control group is provided, and an independent variable is manipulated (for example the treatment provided).To get an overview of the main characteristics of this category of designs, read the relevant sections of Reading 4.2:Required Reading 4.2DePoy, E. & Gitlin, L. 2005, ‘Ch 9 Experimental-type designs’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis, pp 95 – 98.***☻ Activity 4.2A:*** ***Write a few points below on what you believe the characteristics of true experimental designs are:***Quasi-experimentalQuasi-experimental designs may be used when it is not feasible, or ethical, to achieve the conditions required for a true-experimental design (that is randomisation, manipulation and control). Usually, participants in a quasi-experimental design are not randomly assigned to groups, however there is still a control group and manipulation of an independent variable still occurs. When you begin reading occupational therapy and general health care literature, you will find that investigators tend to use quasi-experimental designs more often than true-experimental research designs. This can relate to a number of reasons including: the match between the research question and the approach taken, the level of knowledge which exists about the topic, the constraints of the research environment (perhaps randomisation is not possible or the cost/time constraints do not make it feasible). Regardless of the empirical design chosen, the most important ingredient to judging the quality of the study and its applicability to the clinical environment is your knowledge about how the three features (randomisation, manipulation and control) act to minimise bias in empirical research.To get an overview of the main characteristics of this category of designs, Reading 4.3 has been provided – see the relevant sections on these pages:Required Reading 4.3DePoy, E. & Gitlin, L. 2005, ‘Ch 9 Experimental-type designs’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis, pp 102.***☻ Activity 4.2B:*** ***Write a few points below on what you believe the characteristics of quasi- experimental designs are:***Pre-experimentalPre-experimental designs are used to address Level 1 (descriptive) and Level 2 (relational) type questions. Typically in these designs, two of the three criteria (randomisation, control) are absent. Therefore, if the purpose of the study is to examine the causal relationship between variables, the pre-experimental design is not a good choice. A brief overview of pre-experimental designs are given in the relevant section of Reading 4.4Required Reading 4.4DePoy, E. & Gitlin, L. 2005, ‘Ch 9 Experimental-type designs’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis, pp 104.***☻ Activity 4.2C:*** ***Write a few points below on what you believe the characteristics of pre- experimental designs are:***Non-experimentalNon-experimental designs, such as surveys or observational designs, are used to describe the characteristics of a population. In these designs, the investigator does not manipulate the independent variable, but examines this variable in relation to other variables. These designs may be used to collect information about a variety of variables including attitudes, beliefs, demographic characteristics, activities, knowledge and so on. A brief overview of pre-experimental designs are given in the relevant section of Reading 4.5Required Reading 4.5DePoy, E. & Gitlin, L. 2005, ‘Ch 9 Experimental-type designs’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis, pp 105.***☻ Activity 4.2D:******Write a few points below on what you believe the characteristics of non- experimental designs are:***SamplingSampling is the way by which a researcher goes about selecting the sub-group that accurately represents the population under investigation (DePoy & Gitlin, 2005). The aim is to be able to draw conclusions from the results obtained from the sample, to the larger population. The steps in a sampling process are: to define the population by using inclusion and exclusion criteria, to develop a sampling plan (probability or nonprobality), determine the sample size and implement the sample plan. It is important that the researcher ensures that the population identified has the criteria required for investigating a phenomenon – for example, if you want to investigate the views of people with disabilities, then you need to ensure that you capture the views of people with all types of disabilities. Otherwise, you need to limit your study to investigating only one type of disability, for example, physical disabilities.DePoy and Gitlin (2005) identify the following broad categories of sampling: Probability and Nonprobability sampling. Probability sampling is used when the parameters of a population are known and every member has an equal chance of being selected for the sample. To use probability sampling, a researcher uses an existing framework to draw the sample from, for example using the telephone directory if you want to select a sample from the general public in a specific area. Probability sampling is used when it is important to select a random sample. In empirical studies, probability sampling is preferred since the aim is to generalise the results from the sample back to the population. There are four types: simple random sampling, systematic sampling, stratified sampling and cluster sampling.When the researcher does not have an existing knowledge of the characteristics and size of a population, or access to a framework from which to work, nonprobability sampling is used. There are four sampling methods in this category: convenience sampling, purposive sampling, snowball sampling and quota sampling. These methods are often used in naturalistic studies. When using these methods, the researcher clearly states inclusion and exclusion criteria, and bases the selection of participants on these criteria. These methods are based on participants who are available at the time of recruitment into the study (convenience sampling), or purposefully selecting participants for the characteristics required to investigate the phenomenon (purposive sampling), or asking one participant to identify other suitable participants (snowball sampling), or lastly, quota sampling where specified proportions of participant types are required. Further Reading DePoy, E. & Gitlin, L. 2005, ‘Ch 13 Boundary setting in experimental-type designs’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.***☻ Activity 4.2E:******Now complete the short online quiz for Activity 4.2E to see how you are going in relation to the content of this module.*** |

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| Module 4.3 - Matching studies with design type***☻ Activity 4.3A Matching studies with design type****The titles and abstracts from 5 published empirical research studies are provided in your book of readings. Read through them and decide which design type you think was used (experimental, quasi-experimental, pre-experimental or non-experimental) and write this in the table overleaf. In order to do this task, you will have to look for clues about the three criteria (randomisation, manipulation, control) and recall how they differ for different design types.* *Information about the following will be useful to look for in the abstracts:** *How the participants were selected for the study?*
* *If more than one group is used, what efforts were made to ensure that the groups were equivalent?*
* *Were one or more variables manipulated, if so how?*
* *How was the data collected?*

*Complete the following table:*

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| ***First author, year*** | ***Type of empirical design*** |
| Field, S.J. & Oates, R.K. (2001) |  |
| Lane, A. (2001) |  |
| Hickey (2000***)*** |  |
| Pangrazi, R.P, Beighle, A., Vehige, T. & Vack, C. (2003) |  |
| Blanchard, C.M, Rodgers, W.M., Spence, J.C. & Courneya, K.S. (2001) |  |

*Complete the short online Quiz by giving the types of designs for each of the above.****☻ Activity 4.3B Finding evidence of the 3 criteria in a research article****To consolidate your learning about the concepts of* ***randomisation****,* ***manipulation*** *and* ***control*** *you have been provided with two research articles in your book of readings (one by* Flores 1995*; and one by* Robinson, 1999*. As a critical reader of empirical research, you will need to read actively, asking yourself questions such as the ones below.* *Read through the article and make some notes in response to the following questions:** *Which of the 3 criteria have been addressed or discussed by the author(s)? State them in the space provided below.*
* *Where have the criteria been discussed in the article? (use different coloured highlighter pens to identify references made to each criterion)*
* *Were any of the criteria not discussed? If so state which ones?*
* *Were the missed criteria important to the study design? In what way are they important? Refer back to your notes and activity 1 and comment here.*
* *Why might have these criteria been missed? Did the author(s) state why?*
* *How does the omission of these criteria affect the quality of the study and its findings? (refer back to Reading 4.1 if you need help)*
* *Are there any other strategies that the author(s) should have used to improve the study design?*

***☻ Activity 4.3C Rationale for choice of research design to a research question*** *Revisit the empirical research questions that you came up with last week in Study Activity 3.2A. Choose one of your empirical research questions and select a research design that is best suited to this question. Write a paragraph below providing justification and rationale for your choice (this can be in dot form).Share this in the online discussion room for Activity 4.3C.**Research question:**Choice of design best suited to this question (type and specific detail):**Rational for choice of design:****☻ Activity 4.4D Applying your knowledge to practice****Reflect on the following and share online in the discussion room for activity 4.4D:* * *Can you think of situations in practice where empirical studies would be appropriate?*
* *Can you think of situations in practice where empirical studies would be inappropriate, for example, for ethical reasons?*
* *you are reading a published empirical research study. In order for you to obtain a comprehensive picture of the design of the study, what aspects of the design would you be looking for in a publication? List these below:*
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| Module 5.1 - Naturalistic research designsBackground to naturalistic designsIn module 3 you learned how to write research questions that are suitable for naturalistic inquiry. As you recall, naturalistic research in contrast to empirical research, has a holistic quality, and recognizes that human realities are complex, and that human experiences are subjective. The purpose then of naturalistic research is to **“observe, understand and come to know, so that theory may be described, explained and generated”** (DePoy & Gitlin, 2005 pp.112). There are many approaches to naturalistic research, most having a different philosophical tradition. The purpose of this module is to introduce you to some of the more common naturalistic designs and their important features. It will be important for you to become familiar with these naturalistic designs as they are becoming increasingly prominent in the health care literature.To give you a taste of the challenges facing researchers who embark on a naturalistic research project, reading 5.1 has been included. This short chapter give a useful perspective.Required Reading 5.1 Finlay,L. 2006. ‘Ch 1 Going exploring: The nature of qualitative research’, In L. Finlay & C. Ballinger, C., Qualitative Research for Allied Health Professionals: Challenging Choices. John Wiley & Sons Ltd, UK, 3-8.Common features of all naturalistic research designsAgain, before we begin to discuss some of the specific naturalistic designs, it is useful to touch upon their common or unifying features. As we have discussed earlier, naturalistic research questions tend to be broad to enable the investigator to explore the phenomena of interest in sufficient depth and with flexibility to respond as data emerges in the field. Naturalistic research settings tend to feature sustained contact of the researcher with participants within their natural environment and the data that is produced tends to be rich in texture, descriptive and lengthy (i.e. you have lots of information to contend with). Because the focus in naturalistic research is on achieving depth of understanding, these studies typically involve smaller samples of participants than empirical studies. Whereas participants in empirical studies are generally selected at random to ensure they are representative of the larger population, participants in naturalistic studies may be selected *purposively* on the basis the at they are known to have a rich perspective or understanding of the topic which they can share.A note on use of terminologyThe terms used to describe naturalistic research designs can be confusing and vary in the way they are used. Some terms for example, can describe the perspective of the researcher (i.e. naturalistic, qualitative or interpretive), while others refer to the research design (for example, phenomenology or ethnography). Finally, some terms used to describe naturalistic research refer to the research approach or method used (i.e. case study, focus group). Do not get bogged down in these differences in terminology, but rather try to become familiar with the essential features of each design. It is beyond the scope of this course to explore all of the available approaches, however the following discussion provides a brief description of the more common designs. It includes the following information about each specific design: * a brief overview of the design,
* the desired outcome of the research,
* examples of research questions, and
* possible data gathering methods.
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| Module 5.2 - Types of Naturalistic DesignsAt this point, it would be useful to read the overview of naturalistic approaches provided in Reading 5.2. This reading discusses the philosophical traditions of 10 naturalistic designs and will help you to gain an overview of each design and its primary purpose.

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| Resource Reading 5.2DePoy, E. & Gitlin, L. 2005, ‘Ch 10 Naturalistic inquiry designs’, Introduction to Research: Understanding and Applying Multiple Strategies, Mosby, St Louis. |

PhenomenologyThere is potential for confusion in grasping how the term phenomenology is used, this confusion stems from how the term is used in texts and in common language in relation to naturalistic research. Phenomenology is both a philosophical tradition and a research design. As a philosophical tradition, phenomenology is based on the philosophical assumption that “we can only know what we experience” (Patton, 1990. pp.69) and thus gives rise to the study of how people experience and describe phenomena. Phenomenology as a philosophy underpins much of the rationale for naturalistic inquiry. It is used to explain why it is legitimate to explore phenomena from the individual’s perspective, which is the focus of naturalistic research.However, there are some differences that you should appreciate between phenomenology as a philosophy and phenomenology as a research design. Phenomenology as a research design focuses on how people describe their experience of a phenomenon and how it is they experience what they do. Patton (1990) put this simply as “what is the structure and essence of experience of this phenomenon for these people?” (pp.69). A phenomenon can be an emotion, a relationship, a program, an organisation, or a culture. It is important to note that although a phenomenological study acknowledges the individual nature of experience there is also the assumption that in relation to a phenomenon, there is essential or shared experience. These are the core meanings which individuals share in relation to their experience of the phenomenon. It is the researchers task to elucidate the commonality of human experience. Phenomenographic research is one type of phenomenological research design. Marton and Booth (1997) describes phenomenography as conceptions which often represent something implied, that need not or cannot be said, as it as never been reflected upon. Mapping out the key aspects in the findings is one way of analysis using phenomenography.Phenomenological research aims to produce:* A description of the essence of the phenomenon as it is experienced;
* Or a rich description of the phenomenon;
* Or an interpretation of the meaning of the phenomenon.

Phenomenological questions are aimed at eliciting the essence of experience. Some examples include:* What is the experience of ageing?
* What is the experience of living with a facial burn?
* How do adolescents experience obesity?
* What is the experience of undergoing a mastectomy?
* What is the meaning of caring for an elderly relative for the caregiver?
* What is the experience of chronic disability?
* What is the experience for men undergoing radiotherapy for prostate cancer?

Possible data gathering methods in phenomenology include:* Written descriptions of experience and anecdotes;
* In-depth interviews;
* Participant observation;
* Journaling by the researcher.

EthnographyEthnography as a research approach aims to come to understand the social and cultural worlds of a particular group. Its background lies with anthropology which aims to study various cultural groups. In ethnography, the cultural group may be large (as in a particular ethnic group) or quite small and defined (for instance, the members of a family or people who experience a particular disability). Ethnography aims to understand the world from the participant’s perspective and to describe the behaviours, beliefs, knowledge and meanings from the participant’s point of view. An epistemological foundation of ethnography is the belief that human behaviour can only be understood in the context in which it occurs. Behaviour is viewed as holistic in that, it can only be understood within its functional, cultural, or societal system (Omery, 1988). Due to this orientation, participant observation is a central tool in data gathering.The desired outcome of ethnographic research is an understanding of the common ways of behaving in a given context and understanding what it is like to be part of a group or to live within a particular context.Questions that are concerned with cultural knowledge, norms and values that influence behaviours in a particular context, are the focus of ethnographic research. The questions are directed toward understanding what it is like to be a member or participant of a certain group. Some examples of questions which would lend themselves to ethnographic research include:* What is it like to be a homeless person in metropolitan Adelaide?
* What is it like to be a detainee in a refugee detention centre in Australia?
* What is it like to be a patient of a spinal injuries unit in a rehabilitation hospital?
* What is it like to be a resident in a nursing home?
* What is the lifestyle of the long term unemployed?

Possible data gathering methods appropriate for ethnography include:* Participant observation;
* Interviews;
* Fieldnotes.
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| Module 5.3 - More Types of Naturalistic DesignsGrounded TheoryGrounded theory is an approach to research which uses an inductive process to generate theory. The theory is grounded or derived from the data. Grounded theory is particularly useful if little is known about a topic and there are few or no adequate theories in existence to explain the phenomenon. It can also be used if the researcher is looking for a new perspective on known phenomena. Grounded theory has common foundations with other naturalistic research approaches. These include that there is an inherent belief that reality is socially constructed and that people make sense of their world even if to the observer no overt sense or organization is immediately perceived.Grounded theory uses a structured approach to data analysis which introduces a high degree of rigour to the research. Theory is generated with the confidence that it is grounded in the data and that it has been formulated through a process of constantly comparing the derived categories, codes and themes with the data (data analysis will be discussed in more detail in Module 7). The process of working with data is informed by the researchers theoretical understanding of the phenomena and is continued until no new conceptual information can be gained from the data (reaching a point of *saturation*).The desired outcome of grounded theory research is a new theory based on data that has emerged in the study.The purpose of grounded theory research is to generate a theory, therefore, it is necessary to keep the initial research question broad and flexible to enable exploration of the phenomenon in sufficient detail and depth. The question should state the phenomenon to be studied. Some examples include:* How do women come to terms with the loss of a child at birth?
* How to the family members of a victim of violent crime come to terms with their anger toward the perpetrator?
* How do people make sense of the radiographic procedure they are involved in?
* What happens when a client complains of pain but health care service providers do not believe him or her?
* How do older people come to terms with the loses of family and friends they suffer in their lives?

Data gathering in grounded theory generally follows the pattern of all field research. It can be gathered via the following:* Observation;
* Researcher’s journal where personal feelings and reflections are written;
* Interviews;
* Additional data, such as written records, policies, fictional writing, films, videos, newspapers etc.

The following table has been included to explain the main features and traditions of grounded theory, phenomenology and ethnography. The following table has been adapted from:Liehr, PR & Taft Marcus, M. 1994, ‘Ch 11 Qualitative approaches to research’, Nursing Research: Methods, Critical Appraisal and Utilization, Eds. G LoBiondo-Wood & Haber, Mosby Publishing Inc, St Louis, pp. 261“Comparison of Qualitative Methods, Essence, and Foundations.

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| **Method** | **Essence of Method** | **Foundation** |
| Phenomenology | Description of the “lived experience” | Philosophy |
| Grounded theory | Systematic set of procedures used to arrive at theory about basic social processes  | Symbolic interaction and the social sciences |
| Ethnography | Descriptions of cultural groups or subgroups | Cultural anthropology” |

It is important to be aware that each naturalistic approach has a different philosophical basis which, in turn drives the design, methods for gathering, analysing and reporting information.  Reading 5.3, gives you an illustration of this in relation to grounded theory.

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| Resource Reading 5.3Stanley M. & Cheek J. 2003, ‘Grounded theory: Exploiting the potential for occupational therapy’, British Journal of Occupational Therapy, 66 (4), 143 – 150. |

Descriptive QualitativeDescriptive qualitative studies are those which aim to observe an area of interest in order to gather useful information. These designs are not necessarily linked with a specific theoretical perspective, but do aim to collect a rich description of a phenomenon. The desired outcome of a descriptive qualitative study is to obtain a detailed, rich description of the area of interest.Some examples of qualitative research questions include the following:* What advice do medical practitioners provide about driving to clients who have hand injuries?
* How do health care practitioners gather assessment information from elderly clients?
* What are the symptoms and functional concerns of people suffering from chronic carpal tunnel syndrome?
* What advice do pharmacy assistants give to people enquiring about wrist supports?

Case StudyThe case study methodology aims to study the particular phenomenon in an in-depth manner. The phenomenon of interest may be an individual, a group, a program, a process or an institution. The case study approach uses ethnographic methods to gain a thick or rich description of the experience for the participant(s). The researcher takes an eclectic approach studying a group, individual or situation from as many angles as possible to give a rich description. The strength of this approach lies in the fact that by having only the one phenomenon to study, it can and should be studied in very great detail. This is in contrast to studies which have more informants and thus have to trade off the depth to which the phenomenon can be studied. The desired outcome of case study research is a holistic description of the phenomenon being studied and its context. The outcome of this type of research should illustrate the interaction and complexity of the variables which influence the phenomenon over time.The focus of case study questions should be the phenomenon (i.e. the individual, group, program, institution etc) of interest. Some examples of case study questions include:* What happens when a major mental health organization decentralizes its operations?
* How do people survive in refugee camps?
* What are the effects of chronic illness on a family?
* What is the effect of main streaming students with special needs in the education system?

The data gathering procedures suitable for case study designs include:* Observation;
* Documents;
* Interviews.

Suggested Further ReadingDepoy, E & Gitlin, L.N. 2005. ‘Ch 11 Case Study Designs’, *Introduction to Research: Understanding and Applying Multiple Strategies* (2nd ed). Mosby, St LouisDepoy, E & Gitlin, L.N. 2005. ‘Ch 14 Boundary Setting in Naturalistic Designs’, *Introduction to Research: Understanding and Applying Multiple Strategies* (2nd ed). Mosby, St Louis. |

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| Module 5.4 - Matching Naturalistic Questions with Designs**☻ Activity 5.4A *Matching naturalistic questions with appropriate design****Now that you have had a chance to learn about the more common types of naturalistic designs, you have an opportunity to check your understanding. Below are a series of naturalistic questions which have been posed by researchers. Your goal is to match up each question with the most appropriate naturalistic design. Do this by placing the appropriate initials (i.e. Phen for phenomenology) next to each question (see Key below). Then enter these in the online quiz to see how you are doing.**Naturalistic questions concerned with understanding the human experience of Parkinson’s disease:*1. *What is it like to be part of a chronic illness support group?*
2. *What is the meaning of caring for a partner (husband/wife) who has developed Parkinson’s disease?*
3. *What services/supports do community support groups offer to people with Parkinson’s disease?*
4. *What is the experience of participating in paid employment whilst going through the early stages of Parkinson’s disease?*
5. *How can well-being in older people be conceptualized through a client-centered approach?*

***Key:****Phen – this is a question most suited to phenomenological inquiry**Eth – this is a question best answered using an ethnography design**GrTh – this question is best answered using grounded theory**Desc – this should be answered using a descriptive qualitative design***☻ Activity 5.4B *Practice writing naturalistic research questions*** *Now it’s your turn to practice framing some naturalistic-type research questions. Revisit the naturalistic research questions that you wrote in Module 3.2. In the space provided below, rewrite these questions to reflect each of the specific naturalistic research designs that have been discussed. Beside each question, write the name of the design and some reasons why you think this is so (provide your rationale). Share this online with other students in the discussion room for Activity 5.4B.****1.******2.******3.*** |
| Module 5.5 - Applying Your Knowledge to Practice**☻ Activity 5.5A *Recognising naturalistic study designs****You have been provided with 2 published articles in your book of readings which use naturalistic research methodologies (*Humbert at al, 2006 and Thomas et al, 2008)*. Read each of the articles and identify the following:*1. *What research design was used?*

Humbert et al, 2006Thomas et al, 20081. *What clues or characteristics, stated by the authors, indicated to you that this was the design?*

Humbert et al, 2006Thomas et al, 20081. *What other information would you need to look for in the text to confirm your thoughts? (i.e. what was missing?)*

*The answers for this activity will be available online at the end of the week.***☻ Activity 5.5B Applying your knowledge to practice***Reflect on the following:**Can you think of situations where the use of naturalistic studies would be appropriate? Share your thoughts online with others in the discussion room for Activity 5.5B.**You are reading a published naturalistic research study. In order for you to obtain a comprehensive picture of the design of the study, what aspects of the design would you be looking for in a publication? List these below:* |

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| Module 6.1 - Gathering dataBackground to Data GatheringRegardless of the research approach taken, data gathering is the process whereby information is collected for analysis and interpretation to answer a research question or query. The purpose of this module is to introduce you to the various strategies available in gathering data in empirical and naturalistic studies, and also to discuss rigour in data collection and how it can be maximised.The decision about which data collection strategy to use is influenced by four main factors:* The researcher’s philosophical framework;
* The nature of the research question or query being asked;
* The type of research design (empirical or naturalistic); and
* The practical limitations and resources available to the researcher (time, money, access to research participants).

These factors will all influence the type of data that is collected and the way in which it is analysed. Types of data gathered: empirical vs. naturalisticEmpirical methods gather discrete and measurable information which can be interpreted through numbers and statistics. However, naturalistic approaches gather data that is richly descriptive which is analysed by developing concepts, insights and understandings.Various data collection methods are available to the researcher. These include:* Watching, listening and recording (observation);
* Asking (interviews, questionnaires);
* Obtaining and examining existing material.

These methods are not unique to one research approach, but can be employed under either naturalistic or empirical designs. A good overview of these methods is provided in Reading 6.1. Particularly useful is the discussion of the strengths and limitations of the methods, information about structured and unstructured interviews, and the difference between open-ended and closed-ended questioning. More detail regarding these data collection methods and their application to naturalistic studies is given later in this module.Required Reading 6.1DePoy, E. & Gitlin, L. 2005, ‘Ch 15 Collecting information’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis. |

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| Module 6.2 - Measurement in empirical researchEmpirical research measurement involves the translation of observations into numbers. This process links what the researcher thinks about phenomena (theoretical concepts) to actual variables that can be measured or counted. Furthermore, empirical research focuses on objectivity and replication. That is, if another investigator repeated the research study the findings would be the same. In order to achieve these goals of objectivity and replication in measurement, it is necessary to **conceptualise** and **operationalise** the concepts of interest in the research. This means that the researcher needs to identify and define what is to be measured (conceptualise) and then describe in detail how this concept will be measured (operationalise). Reading 2 provides a good overview of this process; see Figure 16.1 on page 195. Make sure you are clear about this process, as it comprises the first critical step in empirical research.Required Reading 6.2DePoy, E. & Gitlin, L. 2005, ‘Ch 16 Measurement in experimental-type research’ pp 175-180, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.As the researcher thinks of how he or she is going to operationalise the underlying concept of interest, it is also important to consider the **level of measurement** for data gathering. The level of measurement refers to the properties and meaning of the number assigned to an observation. The four levels of measurement (nominal, ordinal, interval and ratio) are described in Reading 6.2 and are illustrated by some examples. Read over this material to make sure you understand it. The level of measurement of data is especially important in empirical research because it influences the choice of statistics which are suitable for analysing the data.**☻ Activity 6.2A Describing levels of measurement***Summarise your understanding of the different levels of measurement by completing the table provided by providing a definition of the* ***properties*** *and* ***meaning of each level*** *and an* ***example*** *that you can think of (that has not been mentioned in Reading 6.2). Share your examples online.*

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|  | ***Definition of properties and meaning*** | ***Your example*** |
| *Nominal* |  |  |
| *Ordinal* |  |  |
| *Interval* |  |  |
| *Ratio* |  |  |

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| Module 6.3 - Rigour in empirical data gathering*Rigour* is an important concept in both empirical and naturalistic research. It relates to the quality of the research, and is a judgement about how effectively a study has been designed and conducted to avoid potential shortcomings. As a consumer of research, you will be interested in assessing the rigour of studies, to determine the trustworthiness of the results before you apply them to your own practice.Rigour in empirical data collection is related to the reliability and validity of the measurement process. The degree of rigor, or trustworthiness, in the measurement process will influence the confidence that others will have about the accuracy of the research findings. **Reliability** refers to the level of consistency obtained between the measurement of variables over different occasions or by different people. Measurement is reliable if, when repeated on different occasions, or by different people, the same (or a very similar) results are recorded. **Validity** refers to the extent to which an instrument measures what it is intended to measure. Reading 6.2 provides a comprehensive overview of the different components of reliability and validity as they relate to data gathering.The diagrams overleaf use an analogy of a dartboard to illustrate the concepts of reliability and validity. Figure 1 demonstrates that if your dart-throwing ability is off-target from the bullseye but the darts still cluster closely together, then you have good precision (reliability) but poor accuracy (validity). Figure 2 demonstrates that you have improved in accuracy (validity) but that your precision (reliability) is poor. This is because although your ability to hit the bullseye is better, your ability to do this repeatedly is not very good. Figure 3 illustrates the situation where you have poor precision and poor accuracy, as your darts are off-target and do not cluster together on repeated throws (obviously you need more practice!). Finally, Figure 4 illustrates excellent reliability and validity. That is, you are able to hit the bullseye and do so consistently on repeated attempts. Well done!

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| **Figure 1** |

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| **Figure 2** |

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| **Figure 3** |

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| **Figure 4** |

Empirical researchers strive to gather data in ways that are highly reliable and valid. This usually means that the researcher seeks outs an instrument that has good demonstrated reliability and validity. If no measure exists, it is expected that the researcher make some effort to test the reliability and validity of the methods of data collection (and any new instrument used). It is important to note that the properties of reliability and validity are related to the population and context under which they are measured, not to an instrument itself. For example, consider that you are a researcher wanting to evaluate the impact of spinal cord injury on the hand function of young adults. You are aware that a particular hand function test, the Sequential Occupational Dexterity Assessment, has demonstrated high reliability and validity in older participants with rheumatoid arthritis. Can you assume that these properties will be the same if you used the measure with your participants who have had a spinal cord injury? Read over the material on validity and reliability in Reading 6.3 if you are unclear about the answer to this question and the reasons why.Required Reading 6.3DePoy, E. & Gitlin, L. 2005, ‘Ch 16 Measurement in experimental-type research’ pp 180-190, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis. |

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| Module 6.4 Gathering information in naturalistic researchThe overall goals and purpose of gathering information in naturalistic research are very different from measurement in empirical research. Here the aim is to uncover the multiple and diverse perspectives of individuals or groups to facilitate exploration, description and understanding. There are four principles that guide the data gathering process regardless of the specific design chosen (eg. ethnography or phenomenology). These are:* The nature of investigator involvement;
* The inductive, abductive process of information gathering and analysis;
* The time commitment in the field;
* The use of multiple data-collection strategies.

Reading 6.4 by DePoy and Gitlin describes each of these principles and provides some examples to illustrate them. Required Reading 6.4DePoy, E. & Gitlin, L. 2005, ‘Ch 17 Gathering information in naturalistic inquiry’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.Earlier in this module, the various methods for gathering information in both empirical and naturalistic approaches were highlighted (observation, asking, examining materials). More specific detail on these various methods as they relate to naturalistic designs is provided in Reading 6.4 on page 219-228. This reading is particularly useful in exploring the process of data collection through asking, and provides some guidelines to assist in obtaining rich description when interviewing (Box 17.2 on page 201). Detail about methods to record information in naturalistic studies is also covered including the use of field notes, audiotape and videotape.Rigour (trustworthiness) in naturalistic data gatheringRigour, or more frequently termed ‘trustworthiness’ in naturalistic data collection is designed to enhance the truth-value of the data collection process and the analytical efforts of the researcher. The goal is to accurately represent what the participants or informants have experienced. In order to ensure the research findings are credible and trustworthy, it is imperative that the methods of the study have been clearly stated and are easy to follow. Furthermore, several strategies are available to the researcher to enhance trustworthiness. These include the use of: * Multiple data gatherers;
* Triangulation;
* Saturation;
* Member checks;
* Reflexivity;
* Audit trail;
* Peer debriefing.

Make notes about the meaning of each of these terms, based on the explanations in Reading 6.4 by DePoy and Gitlin in pages 205-208. It is important to note that the selection of strategies to enhance trustworthiness in naturalistic research must be compatible with the philosophical traditions of the approach. Some of these terms are explained in more depth in reading 6.5. This reading also addresses ethical and sampling issues unique to qualitative research. Reading 6.5Rice, P. & Ezzy. 1999. ‘Ch2 Rigour, Ethics & Sampling’. In P. Rice & d. Ezzy, Qualitative Research Methods: A Health Focus. Oxford University Press: Australia.**Activity 6.5 A**Refer back to the readings (Humbert et al, 2006 & Thomas et al, 2008) you were given in module 5. What methods of rigour can you identify in these studies?What sampling strategies did they employ?Prepare to share your responses on-line.  |

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| Module 6.5 Ethical approval of human researchWhilst the purpose of this module is not to provide a thorough overview of the ethical implications of data gathering and conducting research, it is important to highlight that ethical approval is an important component of any research study. Ethics refers to the study of standards of conduct required of researchers and relates to how a research study is conducted. Ethical application protocols ensure the protection of participants in research studies.Any research study needs to incorporate ethical considerations in its methodology in order to preserve the rights, confidentiality and maintain integrity for all parties involved, such as:* the researchers,
* the research subjects,
* the professional, institution and societal

Researchers have a responsibility to investigate and gather new knowledge in a way that does not harm or disadvantage subjects who participate in their studies. Most institutions (such as universities and public hospitals) have Research Ethics Committees which advise researchers about the ethical considerations for proposed human and animal research. At the University of South Australia, the Human Research Ethics Committee (for postgraduate students, staff) or Divisional Ethics Committee (for undergraduate students) must approve all research that involves human subjects. This involves submitting a proposal outlining the proposed methods of the research, which is then vetted, amended (if necessary) and then approved by the committee BEFORE any of the research is started. Furthermore, if subjects for the study are under the care of another agency (such as a hospital), then ethical clearance by that agency is often also required.Information about the Human Research Ethics Committee at the University of South Australia can be found by reviewing the website <http://www.unisa.edu.au/orc/ethics/index.htm>Go to the website and browse the guidelines for preparing protocols and take a look at the proforma which can be downloaded for submission. This website also contains a link to the Joint NHMRC/AV-CC Statement and Guidelines on Research Practice. These are guidelines on the minimum acceptable standards for research practice involving humans. All studies at the University of South Australia must incorporate these principles. The UniSA ethics website also contains useful examples of consent forms and information sheets, which are a necessary component of the research proposal. These forms serve to explicitly outline:* the nature of participants involvement and time commitment in the study;
* the possible risks and benefits of involvement;
* the right for participants to withdraw from the research without disadvantage;
* the contact details of researchers and the ethics committee in the event that any individual has questions or concerns.

Applying Your Knowledge to Practice**☻ Activity 6.5B***What are the key aspects from this module which would be essential to look for when you are reading an judging the credibility of a published study? Each sub module contains at least one. Write these below and share them online in the discussion room:* |

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| Module 7.1 Analysing DataBackground on Analysing DataHave you ever read an article in the news media that reported the conclusions of a research study but left you wondering how the authors reached that conclusion? When the process of data analysis is not described, it can leave you with doubts about the trustworthiness of the authors’ conclusions. In contrast with the popular media, it is convention within research communication to clearly describe the procedures that were used to analyse the research data, and on which conclusions or recommendations are based. As a consumer of research, you need to have an understanding of data analysis which will enable you to critique the appropriateness of the procedures that the researchers used to analyse the data, and therefore to help guide your judgements about the trustworthiness and relevance of their conclusions. However, many health practitioners lack the knowledge or confidence to critically appraise the analysis of research data.In this module, we hope to provide you with an introduction to the principles that underpin data analysis in empirical and naturalistic research. Obviously this course will not make you an expert in data analysis. However, it should equip you to read, understand and appraise at a beginning level the results sections of research reports. Procedures for data analysis in empirical and naturalistic research differ enormously. In the following materials you will develop an understanding of the key principles for data analysis with each of these broad research approaches. We will begin by considering the quantitative and statistical approaches used to analyse and present data in empirical research. **What is statistical analysis?**In this module, you are not expected to acquire detailed knowledge on how to conduct statistical analysis. The aim is for you to develop a basic understanding of the different types of statistical analyses available and the logical process of selecting a specific statistical test. This will enable you to speak to others about the research process and to become a critical reader of research literature and resources.Whilst some people consider that statistical analysis is a process that is conducted at the end stage of a research study, we believe that it is something that should be considered from the beginning. It is important to develop a plan for analysis when you design a research study (and BEFORE you start collecting your data). This is to ensure that you collect information in a form that is suited to the type of analysis that can best help you answer your research question(s).Types of statistical analysis in empirical researchThere are three types of statistical analyses available in empirical research. These include:* Descriptive;
* Inferential;
* Associational.
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| Module 7.2 Descriptive StatisticsThe first and most basic level of statistical analysis, is **Descriptive statistics,** whichenable the researcher to summarise large amounts of information into smaller sets which are easier to understand and interpret. Descriptive analyses are the first step of analyses for an empirical study to summarise and present the data in a palatable way. Instead of presenting all of the data that was collected in a research study, descriptive statistics are used to give you a quick overview of what was found. Some examples of descriptive statistics include frequency distributions, measures of central tendency (mode, median, mean), measures of variability (range, standard deviation, variance), cross-tabulations (2 x 2 tables) and correlational analyses. For example, see the graph in Figure 1 below. This graphical display summarises the most common standardised assessments used by occupational therapists in South Australia when surveyed in 2001 (undergraduate Guided Research project). The y-axis indicates the names of the most frequently reported assessments, and the x-axis displays the number of occupational therapists using these measures. This figure summarises the data in a concise and easy-to-interpret manner and is referred to as a frequency distribution.*Source: O’Connor D, Congdon A, Elliott S, Goldsworthy A, Heywar J, Janssen M, Lo B, Mitchell C, Pearce H, Rooke N, Waller J. (2001). The use of standardised assessments by occupational therapists in South Australia. Guided Research 301 Report: University of South Australia.*It is important that you familiarise yourself with the various descriptive statistics as they are used most often in empirical research studies. Reading 7.1 by DePoy and Gitlin provide some nice examples to illustrate these statistics for you to practice with.Required Reading 7.1DePoy, E. & Gitlin, L. 2005, ‘Ch 19 Statistical analysis for experimental-type research’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.**☻ Activity 7.2A Summarising data***The table overleaf displays a data set of information collected on 20 subjects on a range of demographic variables. Your task is to summarise the information by doing the following:* *(Note: you may need to refer back to Reading 7.1 for guidelines on how to calculate these descriptive statistics.)*1. *Develop a frequency distribution by age interval (you can select the most appropriate age interval)*
2. *Report the ratio(proportion) of males to females as a percentage*
3. *Calculate the mode, median, mean and range for height*
4. *Calculate the mean and standard deviation for weight*
5. *Develop a frequency table for work status*

*Share your answers online and compare yours with the tutor’s.***Table 1 Demographic data**ID  **Age Gender Height Weight Work status**1 20 m 154 90 waiter2 31 m 173 49 nurse3 36 f 172 54 nurse4 26 m 163 69 secretary5 49 f 169 59 teacher6 19 f 149 69 houseperson7 32 f 158 68 accountant8 47 m 172 59 teacher9 29 f 166 62 nurse10 23 f 176 72 medical doctor11 27 m 166 75 shopkeeper12 43 f 162 66 painter13 62 f 182 59 accountant14 49 m 190 82 babysitter15 28 f 172 79 houseperson16 36 f 173 69 nurse17 18 m 163 76 teacher18 62 f 166 74 secretary19 19 f 154 61 shopkeeper20 55 m 194 89 painter**☻ Activity 7.2B Checking the summarised data for accuracy and any discrepancies***When you are reviewing data that is published in an article, it is often useful to check the information displayed for accuracy and for any discrepancies. The information the authors summarise should add up and make sense (be aware that sometimes it doesn’t!)* *The following table has been taken from a published article studying the effect of wrist splints on carpal tunnel syndrome (CTS). The table summarises the degree of symptom relief experienced by two groups of people with CTS who wore a wrist splint (either in a neutral wrist position or with their wrist in an extended position) for a 2-week period. There were 45 wrists in each group.***Table 2: X2 of Subjective Relief Versus Night-time Splinting Angle at 2 Weeks**Splint Angle Not at all/ A little A lot/ CompletelyNeutral 22 20Extension 21 6X2 value: p = .034*Source: Burke DT, McHale Burke M, Stewart GW, Cambre A (1994). Splinting for carpal tunnel syndrome: In search of the optimal angle. Archives of Physical Medicine and Rehabilitation, 75, 1241-4.**What do you notice when you examine this table carefully? Write your comments below.**What other issues might you consider or want to explore in light of your discovery?**Share your thoughts on the above prompts and compare your answers with the tutor’s.* |

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| Module 7.3 Inferential StatisticsThe second level of statistical analysis is Inferential Statistics. In many studies, especially those with Level 2 or Level 3 research questions, **inferential statistics** are used to answer the research question. Inferential statistics enable the researcher to draw conclusions about a population, based on findings from a sample. A **population** refers to all possible members of a group as defined by the researcher whereas a **sample** represents a subset of the population from which the researcher wants to generalise (those who took part in the study) (see figure below).

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| --- |
| The population of interest |

|  |
| --- |
| Your sample |

The accuracy of inferences made about the population from the sample is dependent on how representative the sample is (sampling techniques). Inferential statistics can also test for relationships among variables in a sample and report whether any relationships (or differences) detected are more likely to have occurred by chance or as a result of the factors in the study. Some examples of commonly used inferential statistics that you may have heard of include the t-test, the ANOVA (one-way analysis of variance), the chi-square test and the Mann-Whitney U test. Inferential statistics are used in empirical research to test hypotheses. It is convention in empirical research to adopt a null hypothesis, that is to assume a relationship or effect does not exist. For example, a researcher may be interested to know whether or not activity groups help to boost the self esteem of people who are experiencing depression. The researcher will assume that the groups are not effective in enhancing self esteem, and wait to see if the data analysis suggests otherwise. This approach is a little like the presumption of innocence in criminal law, in which the weight of evidence must indicate someone is guilty before that conclusion is drawn (i.e. They are convicted). In research, statistical analysis is used to determine whether or not a relationship or effect exists between variables. Even when a relationship between variables is demonstrated by the statistics, the researcher must still determine whether this may have occurred due to chance, or if it indicates a genuine (significant) result.Below is an example of output containing data from a research study. The data has been adapted from Robinson et al (1999). In this example, a researcher was interested in whether a program focussing on reducing children’s television viewing would prevent obesity. The output shows the measures which were taken at baseline level (before the intervention was implemented) and after intervention was implemented. It shows the results of the intervention group and a control group. The P-values illustrate the differences in scores obtained after the intervention was implemented. You will notice that there were 192 participants were involved (see ‘N’). The p-value displayed in the table indicates whether the finding is statistically significant. Usually we use a level of p<0.05 to indicate statistical significance. This means that we would expect this finding to occur less than 5% of the time due to chance. In this example, you will notice that there were significant differences for the groups in the areas of BMI, triceps skinfolds, waist circumference and waist to hip ratio, but not in regards to hip circumference.**Table 1 Children’s Anthropometric Measures**

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| --- | --- | --- | --- |
|  | **Baseline** | **Post-intervention** | **P value** |
|  | **Intervention** | **Control** | **Intervention** | **Control** |  |
| **BMI, kg** | 15.38 | 18.10 | 18.67 | 18.81 | 0.002 |
| **Triceps skinfold thickness, mm** | 14.55 | 13.97 | 15.47 | 16.46 | 0.002 |
| **Waist circumference, cm** | 50.48 | 59.51 | 63.57 | 64.73 | <0.001 |
| **Hip circumference, cm** | 72.78 | 72.70 | 76.53 | 76.79 | 0.50 |
| **Waist to hip ratio** | 0.83 | 0.82 | 0.83 | 0.84 | <0.001 |
| **N= 192** |  |  |  |  |  |

The steps involved in using inferential statistics are:* State a null hypothesis;
* Select a significance level (usually 0.05, 95% confident that findings do not occur by chance);
* Select and calculate a statistical test (parametric, non parametric);
* Obtain a critical value;
* Reject or fail to reject the null hypothesis.

These steps are described in Reading 7.1. Especially useful is the guide for deciding on a statistical test (Box 19.4 on page 237). This provides the types of questions that are important to consider when choosing a statistical test for inferential statistical analysis.  |

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| **Module 7.4 Associational Analyses****Associational analyses** are frequently used to answer Level 2 & 3 research questions. They enable the researcher to identify relationships between multiple variables and to determine whether knowledge about one set of data allows inferences or predictions to be made about another set of data. Some examples of this type of analyses include factor analysis, multiple regression and discriminant function analysis. Some practical examples of these types of analysis are provided by DePoy and Gitlin in Reading 7.1 and are useful to illustrate the value of associational analyses. Ultimately, the choice of statistical test is dependent on a number of important factors. These include:* The research question or hypothesis;
* The level of measurement of the data;
* The sample size;
* The distribution of data.

When planning or critiquing the analysis for a study it is important to consider the **research question or hypothesis** to be tested. These questions and hypotheses should be stated clearly by the researcher to demonstrate the exact purpose of the research. They also assist in guiding the choice of statistical test, as there should be a match between the purpose of the study and the purpose of the statistical test used. When reading research articles, make sure you look for the research questions and hypotheses stated by the investigators and then look for the match between these and the statistical analysis chosen.The **level of measurement** (discussed in Module 6) refers to the form in which data are collected. Data that is categorised into mutually exclusive groups (i.e. male, female) yield **nominal data**. Instruments that require participants to rate a response on an ordered scale where the increments between categories are not know to be equal (i.e. excellent, good, fair, poor) yield **ordinal data**. Measures that produce data on a scale in which increments between points are known to be equal (i.e. range of motion, degrees on a goniometer) produce **interval or ratio data**. As you will have read from DePoy and Gitlin, these levels of measurement are important to analysis as they determine which statistical test is appropriate. For instance, parametric tests (such as the t-test) require data to be collected at the interval-level. The **sample size** and the **distribution of the data** will also influence the selection of statistical test. If the sample size is small and/or the data is not normally distributed (normal bell-curve shape), then the most appropriate statistical approach may be a non-parametric test. However, researchers tend to prefer to collect data that is conducive to parametric testing, as this approach is more likely to detect a significant effect when one exists. |

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| Module 7.5 Applying Your Knowledge to Practice**☻ Activity 7.5A Appraisal of statistical analysis in published articles**You have been provided with a number of empirical research studies that use statistical analysis in your Book of Readings (Todorovich & Curtner- Smith, 2002 & Field & Oates, 2001). Select and read through one of these articles with a focus on the following:1. *What type of statistical analysis has been used in this study (descriptive, inferential, associational)? How do you know?*

*Where is it described in the article?*1. *What is the rationalel to support the specific statistical tests used? Do the authors state this rationale? If not, why might this be?*
2. *What issues would you consider to determine if the use of the statistical tests was appropriate?*
3. *Did the statistical technique used help to answer the research question?*
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| Module 7.6 Analysis of naturalistic researchAnalysis in naturalistic research is very different from that in empirical research. Here, the analysis process is a dynamic or cyclical one where the researcher gathers data in the field and analyses data simultaneously. Data analysis thus begins as soon as the researcher enters the field and informs the next step in the process of data gathering. This dynamic process creates an approach that is flexible and responsive to what is discovered in the field. Although it is recognised that each type of naturalistic design uses different analysis strategies, the purpose of this module is to give you an overview of the stages of analysis in naturalistic inquiry. DePoy and Gitlin in Reading 7.2 outline two distinct stages in the analysis process:**Stage 1: Analysis in the field*** Inductive and abductive thinking;
* Developing categories;
* Grouping categories into higher level abstractions;
* Discovering underlying themes.

**Stage 2: Reporting the findings (formal report writing)*** Refines themes and propositions;
* Derives an interpretation;
* Selects quotes and examples to illustrate interpretation.

Reading 7.2 by DePoy and Gitlin provides a good overview of these stages and the analytical processes involved. They also provide some illustrative examples of analysis taken from different naturalistic designs (grounded theory and ethnography). These are useful to read through to gain a greater appreciation of some of the differences in analysis approaches between the different designs.Required Reading 7.2DePoy, E. & Gitlin, L. 2005, ‘Ch 20 Analysis in naturalistic inquiry’, *Introduction to Research: Understanding and Applying Multiple Strategies*, Mosby, St Louis.During the first stage, using **inductive and abductive thinking**, each piece of data is reviewed and an initial system for organising the information emerges. This, for example, would take the form of reading and re-reading interview transcripts to obtain ‘hunches’ of what is contained in the data (inductive thinking). The investigator formulates working hypotheses of what he/she thinks is happening, and explores this hypothesis to see if it fits elsewhere in the data and when returning to the field (abductive thinking).**Developing categories** is the next stage in data analysis. This is where the researcher starts making sense of the information being gathered in terms of classifying information according to similarities and differences. You will find that books will describe different methods for going about this task. There is also variation in the terms used to describe this process. For example, some authors use the term coding or codes instead of the term categories. Developing categories however is a fairly generic skill in naturalistic research and is relatively similar across approaches. It involves the process of creating categories that describe the pieces of data that are significant. Categories are a means of managing the enormous amounts of data that are collected and to highlight and explore the finer points or nuances in the data.Categories should be mutually exclusive so that the possibility of overlapping is avoided. Furthermore, too many categories may be unworkable. Preliminary categories emerge in the data and then as the data collection process continues, new data is either classified into existing categories or forms the basis for modifying or creating new categories. Naming the category (or code) is important and should accurately describe the concept it represents. This process of developing categories will affect the overall quality of the research, therefore it is important to consider ways to enhance rigour. Some of the methods to enhance rigour include: * establishing intercoder reliability (two people with expertise in naturalistic research independently develop categories and compare their results to ensure the coding process is clear and consistent);
* category rechecking (revisit the categories that have been developed after the passage of time to ensure that the data is viewed in consistently);
* use of a reflective journal (to highlight the researchers thoughts and feelings about the data);
* bracketing (the researcher explicitly describes their own position in relation to the phenomena of interest and then brackets or sets this aside during data gathering and analysis. This is done to minimise the impact on the research of the assumptions or biases that the researcher may hold).

**Developing taxonomies (or higher level abstractions)** is another analysis technique enabling the researcher to group similar categories under a new taxonomy and to describe the relationships between the categories. The development of themes is to start to go beyond coding and to begin to make sense of the layers and the multiple perspectives of the data. At this point, the researcher “further searches for overlap, exclusivity, or hidden meanings among categories” (DePoy & Gitlin, 2005 pp. 246). Themes that are developed are examined with individual data, and then also considered in light of the theoretical knowledge of the phenomena under investigation.Throughout the process of naturalistic data analysis it is important to keep a detailed and accurate account of how the categories, taxonomies and themes were generated. This is often referred to as the **audit trail**. This enables the researcher to check that his or her decisions made were consistent, it enables others to check the interpretations and decisions made by the researcher, provides the basis for reporting the results of the study, and enhances the rigour of the research.Now that you have read some information about the process of analysing naturalistic data, find the article provided to you in your Book of Readings by Lomas & McCluskey (2005). Read the article paying particular attention to the methods and results sections and examine how the authors have supported their interpretations with illustrative quotes and examples from the raw data. Consider the value of their interpretation and coding if these rich descriptions were absent. |
| Module 8.1 What is evidence-based practice?The use of evidence-based practice in the health care environment, has become increasingly important over the past ten years. You have already been introduced to some principles of evidence-based practice in previous modules. The principles and processes surrounding evidence-based practice are the focus of the next five modules in this course. What is evidence-based practice? What is its relevance to health care? What steps are involved in evidence-based practice? What skills do you need to develop to enable you to incorporate evidence-based information into your clinical practice? These are all important questions which you will need to carefully consider in this course. The aim of this module is to provide you with an overview of what evidence-based practice is and its relevance to health care.**What is evidence-based practice?**Evidence-based practice has been described as a process whereby ‘research evidence together with clinical knowledge and reasoning’ are used ‘to make decisions about interventions that are effective for a specific client(s)’ (Law & Baum, 1998, pp.131). This term has been broadened from an earlier term, *evidence-based* *medicine*, which originated from the McMaster University medical school in the 1980s. The term *evidence-based medicine (or practice)* has been described as ‘the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients’ (Sackett et al, 1996, pp. 71). We use the term *evidence-based practice* in occupational therapy to signify the process of incorporating current and relevant research information into how clinical decisions are made, with clients, about their care. As the teaching team for this course perceives it, evidence-based practice is a process that integrates clinical expertise, the best available research evidence and the values and preferences of clients. Swinburn, Gill & Kumanyika (2005) also believes in the incorporation of the views of various stakeholders into current evidence on best practice. This is especially important in health care areas where multiple aspects are involved such as outcomes related to the client’s condition, client satisfaction, key stakeholder perceived outcomes and community outcomes. As you read more about it, you will find that not all authors perceive the same role for clients in evidence-based practice. There is however, general consensus in the literature that the incorporation of evidence into practice should build upon and reinforce, but not replace, clinical judgement and experience. The use of evidence with clinical judgement is an important point, especially where funding bodies base decisions only on research findings.Relevance of evidence based practice to health careEvidence-based practice has become particularly relevant to health care practice, for a number of reasons. As you would no doubt be aware, the competition for and availability of health care funding is becoming increasingly challenging, and there is a need for health care providers to be accountable for the care we provide and the decisions we make. There is a growing volume of health and medical literature being produced, which is becoming more accessible through the advent of electronic technology, so it is becoming more feasible for practitioners to access and use this literature to inform decisions. Furthermore, clients (or consumers) of health care services expect that they will be provided with effective and appropriate treatment according to their needs and preferences. As health care practitioners, we have a professional responsibility to ensure that we provide the best possible care, and demonstrate that the best outcomes are achieved at the least possible cost. For all of these reasons, it is important that you become skilled at using evidence to support your practice.Reading 8.1 in this module provides a brief overview of evidence-based practice in health care. This reading also introduces you to the basic steps involved in evidence-based practice. These include:1. Formulating a clinical question;
2. Searching the literature and collecting relevant evidence;
3. Evaluating the evidence for its validity and usefulness (also called critical appraisal);
4. Incorporating the relevant evidence into clinical decision making with a client;
5. Evaluating the above process to determine how effective it has been.

**Required Reading 8.1** Taylor, M.C. 2007, ‘Ch 1 Introduction’, Evidence-Based Practice for Occupational Therapists, Blackwell Science, Oxford.Reading 8.2 is also provided at this point to give you an overview of evidence-based medicine. This paper by David Sackett and colleagues provides a concise discussion about what evidence-based medicine should and shouldn’t be. In particular, the authors emphasise that evidence-based medicine (or practice) should operate hand-in-hand with clinical judgement and expertise to ensure that the most effective and safest treatment options are provided to patients.Required Reading 8.2Sackett, DL, Rosenberg W, Muir Gray, JA, Haynes, RB, & Richardson WS. 1996, ‘Evidence based medicine: what it is and what it isn’t. *British Medical Journal*, 312, 71-72. **☻ Activity 8.1A Factors involved in clinical decision-making***In light of what you have learnt about evidence-based practice so far, reflect upon the factors that you believe will influence the process of making decisions about the care of your client(s).* *Consider the process and strategies that you draw upon when making a decision about the care of your client. Will drawing upon current available evidence be part of this process? If so, how will it fit in with the other factors that help you make decisions? Share your thoughts online with other students in the discussion room for Activity 8.1A .*Suggested Further ReadingBury, T (1998). ‘Ch 1, Evidence-based healthcare explained’. In T. Bury & J. Mead, *Evidence-Based Healthcare: A Practical Guide for Therapists*. Butterworth Heinmann, Oxford.Tickle-Degnen, L. 1999, ‘Evidence-based practice forum: Organizing, evaluation, and using evidence in occupational therapy practice’, *American Journal of Occupational Therapy*, 53(5), 537-9.Dubouloz, C.J., Egan, M., Vallerand, J. & vonZweck, C. 1999, ‘Occupational therapists’ perceptions of evidence-based practice’, *American Journal of Occupational Therapy*, 53(5), 445-53.Swinburn, B., Gill. T., Kumanyikas (2005). Obesity prevention: a proposed framework for translating evidence into action. *Obesity reviews* (6), 23 – 33. |

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| Module 9.1 Posing questions and finding the evidenceIn order to be able to engage in evidence-based practice, it is important for you to develop skills in framing clinical questions and being able to search for the relevant evidence to answer these questions. Clinical questions refer to those that include information about your **client population or problem**, **intervention**, and **outcomes** in a clear and specific way in order for you to search the evidence effectively. Clinical questions can be answered by a combination of reviewing the published literature and applying critical appraisal, decision-making and clinical reasoning to the literature reviewed. They differ from research questions, which are typically answered by gathering and analysing data first-hand.Searching for and finding the evidence in the literature involves knowing what type of information you need, the likely sources of this information and a strategy to access it. The aim of this module is to introduce you to the steps involved in posing clinical questions appropriate for evidence-based practice inquiry and to discuss some of the methods for finding the evidence. Framing clinical questionsClinical questions in evidence-based practice need to be clear and concise in order to make the process of searching for information and answering the questions feasible and time-efficient. Most commonly, four components are identified and included in a clinical question. These four components of a clinical question can be remembered by using the acronym PICO:**P** The population or problem that you are interested in. This can be a client, group or clinical problem**I** The intervention that you think may be of value for this problem**C** The comparison or alternative intervention (where relevant) **O** The outcome or reason for using the interventionReading 8.1 from Module 8 by Taylor (2007) introducted you to the process of asking clinical/ review questions and provided 6 scenarios in which the components of the evidence-based practice inquiry were identified and framed as a clinical question (see pages 8 – 14). Note that in some instances in health care practice it may not be relevant to incorporate a comparative intervention in the clinical question. The comparison intervention component would be added in instances when you were trying to decide if one treatment option was superior to another.Reading 9.1 for this module by Lou also discusses the process of framing clinical questions. The authors have presented an example of the components necessary for an evidence-based practice inquiry.Required Reading 9.1 Lou, J.Q. 2002, ‘Ch 5 Searching for the Evidence’. In Law, M. Evidence Based Rehabilitation, pp 72 – 75. **☻ Activity 9.1 A Identifying components and framing clinical questions***The following scenarios have been provided for you to practice the process of identifying components and framing clinical questions. For each scenario, identify the 3 or 4 components of the problem and frame them into a clinical question. Insert these online quiz and compare your responses to the tutor’s.***Scenario 1***You are working in a rehabilitation hospital in a multidisciplinary care team with clients who have experienced a stroke. The head of the unit has just returned from a conference where she discussed the rehabilitation process with staff from another interstate rehabilitation facility. There they are trialling a new program where they are offering some allied health rehabilitation services in the home and are finding the process successful to date. You are interested in the impact of this new delivery option as compared with the traditional delivery of allied health rehabilitation services as an inpatient on the functional outcome for clients who have experienced a stroke.**Components:**Clinical question:***Scenario 2***You are working in a country practice and a referred an elderly female client with rheumatoid arthritis in both of her hands. Her main concern is her pain, which is currently keeping her awake at night. You do some initial reading and determine that splinting in the resting position and/or wearing compressive gloves may provide some relief of her symptoms however you are unsure whether one treatment is superior to the other or if both would be beneficial. You have discussed the needs and preferences of your client with her, and she is agreeable to either or both of the options.**Components:**Clinical question:*The examples presented above each pose clinical queries directed towards the type or delivery of a particular treatment approach. However, questions that are compatible with the evidence-based practice process can also be directed toward other factors involved in patient care. These include:* **Diagnostic tests and/or assessments**. These are concerned with evidence to direct the appropriate selection and interpretation of particular tests or assessments for clinical situations.
* **Prevention**. This is concerned with the evidence for identification and modification of risk factors for disease or occupational dysfunction.
* **Prognosis/prediction**. This is concerned with the evidence to predict the consequences of an illness, disease, disability or condition on an individual.
* **Client concerns/needs/issues/feelings**. Evidence here is concerned with the individual and their perceived concerns, issues etc.
* **Economic evaluation**. This is concerned with the evidence to support the cost-effectiveness of interventions.
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| Module 9.2 Types of EvidenceDepending on your specific clinical question, the type of evidence that you will need to search for will vary. In order to answer this clinical question, it is now necessary for you to consider the most appropriate form/type of evidence that will provide you with the information you need.What constitutes ‘evidence’?Reading 8.1 and 9.1 introduced you to the concept that evidence for informing clinical decisions could be drawn from multiple and different sources such as clinical experience, discussion with clients and/or colleagues, textbooks, continuing professional educational opportunities (such as conference/workshops) and research studies. However, the term ‘best evidence’ (or the use of the word ‘evidence’ in the context of *‘evidence-based practice’*) primarily refers to scientific evidence that is collected through systematic research. Evidence that is obtained from well-performed research is usually thought to be less prone to bias and more likely to be up-to-date than other types of evidence (i.e. textbooks, expert opinion). This type of evidence, collected from clinically relevant research, is labelled according to the methodology used to collect it. Some examples of types of evidence include:* Systematic reviews or meta-analyses – a systematic, specific review of all available literature, published and unpublished, in order to collate and assess the quality of the existing data on a specific question. Data is then subjected to a statistical technique, meta-analysis, to analyse the data across studies.
* Randomised controlled trials – the most rigorous form of experimental design study in which an intervention’s effectiveness is tested using random allocation of participants to treatment and control groups. Often described as the ‘gold standard’ in terms of evidence as this design minimizes bias through blinding and is the best design for testing cause-effect relationships.
* Non-randomised controlled trials – experimental study designs that do not employ randomization e.g. single group pre and post testing.
* Case-controlled studies – designs in which participants experiencing the phenomena to be studies are matched with a control group that does not experience the phenomenon. This design is useful for investigating the cause of a condition by examining the variance between the two groups.
* Cohort studies – take groups or ‘cohorts’ of individuals and study them over a period of time either retrospectively or prospectively. Data gathered can inform practitioners about the causation of a disease process or the impact of a treatment.
* Descriptive studies – studies that describe a population or phenomenon but do not examine relationships between variables.
* Qualitative studies – a range of methods aimed at exploring and understanding events and phenomena as they occur naturally.
* Opinion based on experience – expert opinion from the field that is based on clinical experience rather than formal study.

Hierarchy of evidenceSeveral ‘hierarchies of evidence’ have been suggested in the literature. These hierarchies make value judgements about what constitutes ‘best evidence’. These hierarchies traditionally have arisen from medical literature and tend to be organised in descending order with respect to the extent to which the respective methodologies can minimise bias/error in the conclusions reached. An example of a hierarchy of evidence is presented by Law in p 98-101 and 103 – 105. You will observe that the highest level of evidence is considered to be systematic reviews as they draw their conclusions from multiple randomised controlled trials (often considered the ‘gold standard’ of methods to reduce bias). However, it is worth noting that these hierarchies are usually created with questions regarding ‘treatment’ in mind. It is suggested that when looking for information regarding treatment effectiveness (one treatment compared to another, or compared to no treatment) that methodologies such as randomised controlled trials or systematic reviews are most rigorous. This is because they best address the issues of randomisation, manipulation and control, and hence minimise bias (refer back to Module 4 if you have forgotten how randomisation, manipulation and control influence bias). Within health care there are many different opinions about the levels of evidence. Swinburn, Gill and Kumanyika (2005) for example advocate for the use of many types of evidence including the opinions of stakeholders to address complex interventions such as in the field of obesity prevention. The teaching team believes it is more important to **match the type of evidence with the type of clinical question being asked**. In this way, the type of studies sought after in your search for the ‘best evidence’ will be dictated by **the most appropriate methodology for the question being asked**. Reading 9.2 by Bennett and Bennett (2000) posed a framework for evidence-based occupational therapy which replicated in your textbook (Taylor, 2007, p10). Bennett and Bennett (2000) also gives an overview of the different types of evidence that are desirable for different types of clinical questions in a table given to you in reading 9.2 (page 174). Notice how naturalistic studies are deemed most appropriate for evidence concerning patients concerns and issues, whereas randomised controlled trials (RCTs) feature more prominently for treatment questions. The authors of this reading also challenge the notion that RCTs provide the best form of evidence for ‘treatment’ questions in rehabilitation contexts. They argue that such RCTs may not be the most appropriate form of evidence due to the highly individualised nature of treatments delivered by occupational therapists and the heterogeneity (or differences) amongst the clients we see. It is important for you to be aware of this continuing debate over the hierarchy of evidence and for you to develop critical skills in deciding on the ‘best evidence’ to answer your evidence-based practice questions. Bennett and Bennett summarise by stating the “best evidence comes from studies with the strongest and most appropriate methodologies for the specific clinical question under consideration” (Bennett & Bennett, 2000, pp.176).Required Reading 9.2Bennett, S. & Bennett, J. 2000, ‘The process of evidence-based practice in occupational therapy: informing clinical decisions’, *Australian Occupational Therapy Journal*, 47(4), 171-80.**☻ Activity 9.2A Deciding on the type of evidence to answer a clinical question and justifying your choice***You are considering two different forms of treatment for a group of clients that you are working with. You wonder which form of treatment will be most* ***acceptable*** *to this client population. You consider undertaking a review of the evidence to help inform your decision.* * *What type of evidence would you look for to answer this question concerned with the* ***‘acceptability of treatment’****?*
* *Which* ***types of study methodologies*** *would contain this sort of information?*

*Use the space provided below to propose the* ***type of evidence*** *you would be looking for and* ***justify*** *your choice.**Share your ideas online with others in the discussion room for this activity.*Suggested Further ReadingHumphris, D. 1999, ‘Ch 2 Types of evidence’, In S. Harmer & G. Collinson, *Achieving Evidence-Based Practice: A Handbook for Practitioners*, Bailliere Tindall, Edinburgh. |

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| Module 9.3 Searching for the evidenceNow that you have had some practice formulating evidence-based practice questions and considered the different types of evidence that might constitute the ‘best’ evidence for your clinical question, the next step is to search for the evidence. Reading 9.3 by Lou provides a good overview of the steps to finding evidence. We have already discussed framing your question (step 1) and deciding on the type of evidence you require. Other steps involved in finding the evidence include:* Deciding on the information sources that need to be checked;
* Devising an efficient information retrieval strategy to elicit the relevant information from those sources.

A two-hour workshop has been organised with a librarian from the University of South Australia library to go over some of these principles. Make sure you have covered the material in Reading 9.3 prior to attending this workshop. Attendance is essential for completion of your last assignment.**Required Reading 9.3**Taylor, MC. 2007, ‘Ch 2 Finding the evidence’ and ‘Ch 7 Useful resources’, *Evidence-Based Practice for Occupational Therapists*, 2nd ed, Blackwell Science, Oxford, pp 20-42.☻ ActivitiesDuring the next 3 weeks, you will be participating in journal club activities. In week 8 (Thurs 7th May) an in-class tutorial will include a journal club activity. During week 9 and 10, journal club will be on-line and assessed. The information about this is in the course information booklet. Appendix 3 of this study guide gives some critical appraisal questions as a guide.In week 10, you will need to attend a library session. You will be notified of when this will be occurring during the week. It would be beneficial if you read through the requirements for Assignment 3 in your Course Information Booklet before attending the library session. Also read Module 9.3 before you attend your session.Other useful readings discussing strategies to locate evidence or provide an overview of useful resources are outlined below.Suggested Further ReadingsLou, J.Q. 2002, ‘Ch 5 Searching for the Evidence’. In Law, M. Evidence Based Rehabilitation, pp 75 - 90. Del Mar, C. & Jewell, D. 1998, ‘Ch 3 Tracking down the evidence’, In C. Silagy & A. Haines *Evidence-Based Practice in Primary Care*, BMJ Books, London.Davoren, JB. 1998, ‘Ch 6 Searching the internet’, In D. Friedland, A. Go, J. B. Davoren, M. G. Shlipak, S. W. Bent, L. L. Subak & T. Mendelson *Evidence-Based Medicine: A Framework for Clinical Practice*, Lange Medical Books, New York.Snowball, R. 1998, ‘Ch 3 Finding the evidence: an information skills approach’, In M. Dawes, P. Davies, A. Gray, J. Mant, K. Seers & R. Snowball *Evidence-Based Practice: A Primer for Health Care Professionals*, Churchill Livingstone, Edinburgh.Hunt, DL. Jaeschke, R. McKibbon, KA. 2000, ‘Users' guides to the medical literature: XXI. Using electronic health information resources in evidence-based practice’. *Journal of the American Medical Association*. 283(14), 1875-9.**Other useful electronic sources:**OT Seeker: Occupational Therapy Systematic Evaluation of Evidence:<http://www.otseeker.com/>Centre for Allied Health Evidence<http://unisa.edu.au/cahe/default.asp>University of South Australia Library Internet resources for evidence based health care<http://www.library.unisa.edu.au/internet/pathfind/ebmed.htm#intro>Teaching/learning resources for evidence based practice (EBP) from the Research Centre for Transcultural Studies in Health Care, Middlesex University, UK<http://www.mdx.ac.uk/www/rctsh/ebp/main.htm>Users' Guides to Evidence-Based Practice from the Canadian Centres for Health Evidence<http://www.cche.net/usersguides/main.asp>The Australasian Cochrane Centre<http://www.cochrane.org.au/>The Joanna Briggs Institute for Evidence Based Nursing and Midwifery<http://www.joannabriggs.edu.au/welcome.html>TRIP database for evidence-based practice information<http://www.tripdatabase.com/index.cfm>Database of Abstracts of Reviews of Effectiveness (DARE) at the University of York<http://nhscrd.york.ac.uk/darehp.htm> |

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| Module 10.1 Making sense of the evidenceIn the previous modules we have introduced the steps involved in the process of evidence-based practice, discussed how to pose EBP questions and formulate strategies to find the evidence. However the process does not stop here. Once some relevant evidence has been located, it is necessary to make some judgements about the evidence according to its **validity** (closeness to the truth) and its **applicability** to your clinical situation. This process of evaluation is often referred to as **critical appraisal**. In this module we will discuss some of the important elements of critical appraisal, introduce you to some tools for critical appraisal and provide you an opportunity to practice these skills.What is critical appraisal?Critical appraisal is “a systematic way of considering the truthfulness of a piece of research, the results and how relevant and applicable they are” (Bury & Jerosch-Herold, 1998, pp. 138). This process is designed to help you make decisions about the appropriateness of drawing parallels about your clinical situation and the findings of the research you read. Critical appraisal is useful because:* It ensures a thorough assessment of all aspects of a research study;
* It reduces the likelihood that you will be mislead by an author’s conclusions when they are not supported by data;
* It helps you to integrate evidence from multiple sources and acknowledge the strengths and weaknesses of each (critical appraisal provides you with a framework to judge quality);
* It improves your own understanding of research methods;
* It encourages implementation of effective interventions in practice;
* It facilitates the interaction between research and the generation of knowledge.

Any form of critical appraisal aims to address these fundamental questions:1. Are the results of the study valid (truthful)?
2. What can be learnt from the results?
3. How significant are the results of this study (is it clinically important)?
4. Will the results help me in understanding and caring for my own clients?

At this point, Reading 10.1 is provided for you. This material discusses the use of checklists for critical appraisal. The authors point out that there are multiple critical appraisal checklists available according to the type of study methodology being evaluated. However, the author has synthesised the principles of critical appraisal into three areas: one for clinical trials (Chapter 3), one for systematic reviews (Chapter 4) and one for qualitative research (Chapter 5). Read through the critical questions about the validity, findings, and applicability of the research and consider what factors would influence your judgement when trying to make sense of the evidence.**Required Reading 10.1**Taylor, C. 2007, ‘Ch 3 Using clinical trails as evidence; Ch 4 Systematic Review; Ch 5 Qualitative research as evidence’, In C. Taylor, Evidence based practice for occupational therapists. Blackwell Publishing, UK.Another well-regarded source of critical appraisal guidelines is the McMaster University Occupational Therapy Evidence-Based Practice Research Group. They have published guidelines, specifically tailored to meet the needs and perspectives of occupational therapists when critically appraising evidence, and provide a critical review form for both qualitative and quantitative studies. Read through these guidelines, provided in Reading 10.2, and determine whether they differ from those suggested by Taylor (2007). If there are differences in the critical appraisal questions, what are they? Are they important to occupational therapy? Which critical questions do you prefer or consider important?

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| Resource Reading 10.2Qualitative and quantitative critical review guidelines and forms produced by the Occupational Therapy Evidence-based Practice Research Group at McMaster University, Canada  |

Reference and Further ReadingBury, T. & Jerosch-Herold, C. 1998, ‘Ch 7 Reading and critical appraisal of the literature’, pp136-144, 149-161 In T. Bury & J. Mead *Evidence-Based Healthcare: A Practical Guide for Therapists*, Butterworth Heinemann, Oxford. |

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| Module 10.2 Practicing Critical Appraisal**☻ Activity 10.2A Asking critical questions from a research abstract***Read the following abstract, which was published in the Australian Journal on Ageing in 1996. After reading it once or twice, make a list of questions that you would be looking to answer when you read the full article. These questions should be things that you would be curious to know about, and relate to the critical appraisal questions you have developed in the previous study activity. Asking questions as you read an abstract can be a useful technique to ensure that you read research articles critically, rather than accepting the findings and conclusions written by the authors at face value.**Use the space provided at the end of the abstract to make your list of questions that you would want answered in the full paper.**Richmond, D. & McCracken, H. 1996, ‘Health promotion education for the elderly: Experience in an academic department of geriatric medicine’ Australian Journal on Ageing, 15(1), 18-21.* *Abstract**A health promotion and education program for elderly people was based in the academic Department of Geriatric Medicine of the University of Auckland for four and a half years. Its major objectives were to undertake health education and promotion research, develop community-based initiatives in health education, produce educational resources relevant to older adults and train other personnel to lead health education programs. Considerable progress was made in meeting these objectives. Formal evaluation of the long-term impact of programs, whose results may not be evident until after many years, is difficult. However, despite the fact that the program was terminated sooner than had been anticipated because of loss of funding, there was evidence that it had been successful. The achievements of the program were not only of value to the community of older people but to the Department itself. It is concluded that health promotion and education programs are worthwhile activities to be included within university departments of geriatric medicine.**List your critical questions about the study here and share these in the on-line discussion.*Journal Club What is a journal club?The scope and purpose of a journal club is outlined in your textbook (Taylor, 2007) on pages 129 and 130. We will be establishing a journal club as part of our learning. This will have 2 components: In class and on-line.Basic norms for journal club activitiesThe following norms are typical of those that you might establish for a journal club. The purpose of having norms for a journal club is to facilitate the active and balanced participation of all members and to contribute to the effective review of articles.* These basic norms will be used to guide the conduct of the Journal Club activities in this course.
* All members of the tutorial group will attend the Journal Club session and participate on-line.
* For the in-class session, each group will appoint a chair person and a scribe.
* Each group member comes prepared, having read and critiqued the two articles to be discussed at the session
* All group members will actively contribute ideas to the discussion, not just listen
* Debate and discussion is encouraged but should focus on ideas and issues not the people expressing the ideas
* Group members will actively encourage others to contribute to the discussion (e.g. invite ideas, respond to and build upon ideas expressed etc.)
* Criticisms of ideas presented by participants in the sessions should be expressed in ways which are respectful and constructive

FORMAT**The chair of each group in class will use the following format to lead the discussion. This format will also structure the on-line discussions.** **PURPOSE & RATIONALE FOR STUDY** Could you clearly identify the purpose of the study? Does the literature review flow logically to make a strong argument for the purpose of the study? Is this are a strength or a weakness of the article?**DESIGN & METHODOLOGY**Could you clearly identify the research design and methodology used? Are there any information missing? Is this area strength or weakness of the study?**DATA COLLECTION**After reading the article, are you clear on how data was collected? Does it include all the essentials for you to form a picture of how this was done? Is this a strength or a weakness of the study?**MEASURES TO ENSURE TRUSTWORTHINESS OF DATA/ RIGOUR**Could you identify any measures used to ensure trustworthiness/ rigour of data? Do you think that if another researcher duplicated this study, that they would have the same results (for quantitative)/ Are there any factors which may have impacted on the study which were not accounted for? Are the findings credible? Is this area a strength or weakness of the study? **DATA ANALYSIS**Are you clear on how the data was analysed? Any information missing? Is this an area of strength or weakness of the study?**IMPLICATIONS OF RESULTS/ FINDINGS**Do the results/ findings contribute to the OT knowledge base? Does it have practical / research implications? Is it generalisable to other contexts? Is it a strength or weakness of the study?**DISCUSSION AND CONCLUSION**Do the researchers discuss any limitations of the project that you may have noticed while reading the article? Do they account for these limitations? Do you find their results/ findings credible?**OTHER DISCUSSION**Any other thoughts related to the article.PROCEDURE AND PREPARATIONIn-class journal club * During tutorial. NOT ASSESSED.
* In preparation for this students complete module 10 and critically appraise 2 articles using a format of their choice.

Articles to be appraised are **Human Movement***Quantitative – in module 4 of book of readings.*Flores, R 1995, Dancing for health: Improving fitness in African American and Hispanic adolescents, *Public Health Reports*, 110, 2, 189 – 193.*Qualitative – in module 5 of book of readings.*Humbert, ML, Chad KE, Spink KS, Muhajarine N, Anderson KD, Bruner MW, Girolami TM, Odnokon P, & Gryba CR, 2006, Factors that influence physical activity participation among high and low SES youth, *Qualitative Health Research*, 16, 467 – 483.PROCEDURE AND PREPARATIONOn-Line Discussion* Occurs over 2 weeks – week 9 and week 10.
* Facilitatory Questions provided to reply to.
* Reflective piece to be handed up – details in course information booklet

Articles to be appraised are: **Human Movement Students***Quantitative – in module 4 of book of readings*Robinson, T 1999, Reducing children’s television viewing to prevent obesity: A randomised controlled trial, *JAMA*, 282, 1561 – 1567. *Qualitative – in module 5 of book of readings*. Thomas, SL, Hyde, J, Karunaratne, A, Herbert, D, & Komesaroff, PA, 2008, Being ‘fat’ in today’s world: a qualitative study of the lived experiences of people with obesity in Australia, *Health Expectations*, 11, 321 – 330. Other useful resources on critical appraisal are listed below. Particularly useful are the chapters by Trisha Greenhalgh (1997) on how to efficiently read research papers and evaluate their quality. The pocket guide by Ian Crombie (1996) also provides critical appraisal checklists for surveys, cohort studies, clinical trials, case-control studies and review papers. Suggested Further ReadingsGreenhalgh, T. 1997, *How to Read a Paper: The Basics of Evidence Based Medicine*, BMJ Publishing Group, London.Crombie, I. 1996, *The Pocket Guide to Critical Appraisal: A Handbook for Health Care Professionals*, BMJ Publishing Group, London.Taylor, MC. 2000, ‘Ch 5 Qualitative research as evidence’, *Evidence-Based Practice for Occupational Therapists*, Blackwell Science, Oxford.Gray, J. 1997, ‘Ch 5 Appraising the quality of research’, *Evidence-Based Healthcare: How to Make Health Policy and Management Decisions*, Churchill Livingstone, New York.Barbour, RS. 2001, ‘Checklists for improving rigour in qualitative research: a case of the tail wagging the dog’, *British Medical Journal*, 322, 1115-7.National Health and Medical Research Council. 1999, ‘How to review the evidence: Systematic identification and review of the scientific literature’, *National Health and Medical Research Council*, Canberra.☻ ActivityAs this point it is important to be aware that your last assignment for this course is about conducting an EBP review. You may wish to read about the assignment requirements if you have not already done so. |
| **Module 11.1 Putting the evidence into practice**The fourth step in the evidence-based practice process is integrating this evidence into practice. This involves assessing the meaning that evidence has for clinical practice (judging its applicability) and communicating and using this evidence with your clients.As you would be well aware by now, evidence-based practice is another tool to aid clinical reasoning and to ensure that consumers of health care services receive the best quality care possible. Whilst health practitioners can continue to draw upon evidence derived from multiple sources (clinical experience, discussion with peers, clients, review of professional literature), the use of evidence-based practice provides a method for organising and incorporating the ‘best’ and ‘most current’ evidence from well-conducted studies into clinical practice. In this way, evidence-based practice does not advocate a ‘cookbook’ approach to the care of clients, overshadow clinical expertise, nor negate the concept of the client-centred approach. In contrast, it provides you with **an added source for which to draw knowledge and information to help you make clinical decisions**.**Assessing the meaning that the evidence has for practice**The first stage in putting the evidence into practice is to assess the meaning that it has for practice. This is not an easy task as you need to ask yourself: ‘*What does all of this information mean for my client?*’. In the last module, when critical appraisal of the evidence was discussed, you considered and developed your own critical questions on how to judge whether findings from a research study are applicable and meaningful to a clinical situation. In order to do this, it was necessary to consider some of the following issues:* Are the characteristics of the study participants similar to those of your client?
* Is the context or setting of the study different or similar to the one in which you are involved?
* Were the outcome measures reported in the study relevant to your client and his/her values and interests?
* Were the outcomes reported appropriate to the condition being studied and your client’s condition?
* Do you have access to the same resources and possess adequate skills as those described in the study to implement the evidence in your context?
* Do you consider the focus of the study (that is the treatment provided, the assessment conducted etc) to be compatible with your client’s preferences and values?

The process of evaluating the meaning of evidence and its use when making decisions about clients needs to be coupled with clinical expertise in the area. Even if the findings of a research study point to a positive and beneficial outcome, factors such as: * the context of therapy;
* the environment in which the client lives;
* the client’s cultural beliefs and preferences; and
* your accessibility to resources

are also important in influencing the final decision of whether to incorporate this evidence into your care of your client.It is also worth noting that in many instances, you may find it difficult to locate all of the necessary evidence to make your clinical question easy to answer. It may be partially answered by the evidence, or there may be conflicting or insufficient research evidence concerning the question. If the evidence is conflicting, you should return back to your critical appraisal judgements and make some decisions about which studies were the most rigorous (valid) and which studies were conducted in situations most similar to yours (usefulness). In these situations, the best available evidence is used and the limitations of these sources acknowledged when communicating with your client. When no research evidence is found to answer a clinical question, expert opinion and clinical reasoning skills are considered to be the most appropriate source of best evidence. However remember, these instances should be communicated with your colleagues and identified as opportunities and priorities for future primary research. You never know, you may even want to become actively involved in this process yourself! As you can see, this evidence-based practice process can also provide a circular relationship with research: both using it and also shaping its future directions.**Using evidence to guide practice decisions: Use of reflective practice**Taylor (2007) states that evidence-based practice is not about “*doing* research, [but] it is about *using* research very explicitly to underpin the decisions we make on a daily basis as practitioners” (Taylor, 2007, pp. 128). In order to be open to this approach, health practitioners are encouraged to engage in reflective practice, that is, look critically at what they do and why. The process of reflection involves “describing an event and then looking at the decision-making and reasoning process which underpin the actions taken within that event” (Taylor, 2007, pp. 128). Under a reflective framework, the evidence-based practitioner would ask themselves:* Is there any evidence to underpin the decisions I made in this situation?
* Have I searched for the best and most current evidence to underpin this decision (i.e. choice of intervention, assessment tool etc)?
* Have I critically appraised this information?
* Are there any professional or local standards and guidelines that are relevant to this situation?
* Have I critically appraised this information?
* Am I involving the client in the decisions about their care?
* Am I informing the client of the evidence-base for these decisions?
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| Module 11.2. Communicating the evidenceAs mentioned earlier when discussing reflective practice, the process of effectively communicating the evidence with your client and involving them in the decision-making process is crucial to evidence-based practice and client-centred approaches in occupational therapy. Linda Tickle-Degnen has described the steps involved in using and communicating the evidence with particular clients very eloquently in her recent series of papers (Tickle-Degnen, 1998a; Tickle-Degnen, 1998b). Reading 11.1 by Tickle-Degnen (1998a) walks you through the steps of developing clinical questions about a client, retrieval of relevant evidence, methods to interpret the results for a single client and how to communicate the results with clients and families effectively. She advocates the following guidelines to facilitate discussion and collaboration when reviewing the evidence with a client:* Validate the importance of client and family decision making;
* Use clear, simple language to summarise the research evidence;
* Individualise the research findings to those that are relevant to the client and his/her family;
* Acknowledge that the evidence may be weak if few studies have been conducted or if they are not particularly rigorous;
* Offer to discuss the costs and benefits of participating and not participating in treatment.

Also of particular value are the steps for interpretation of evidence outlined on Table 2 on page 156. Tickle-Degnen additionally provides an example of a dialogue between an occupational therapist and a client during the information exchange process (page 158-9). This provides a useful and tangible example on which to start communicating with clients about evidence. Required Reading 11.1Tickle-Degnen, L. 1998a, ‘Using research evidence in planning treatment for the individual client’, *Canadian Journal of Occupational Therapy*, 65 (3), 152-9.Other useful readings directed at the process of incorporating evidence into practice are listed below.Suggested Further Reading Tickle-Degnen, L. 2003, Communicating evidence to clients, managers and funders, p 229 – 234. In Law, M. *Evidence Based Rehabilitation*.Tickle-Degnen, L. 1998b, ‘Quantitative research series: Communicating with clients about treatment outcomes: The use of meta-analytic evidence in collaborative treatment planning’, *American Journal of Occupational Therapy*, 52 (7), 526-30.Egan, M. Dubouloz CJ. Von Zweck, C. Vallerand, J. 1998, ‘The client-centred evidence-based practice of occupational therapy’, *Canadian Journal of Occupational Therapy*, 65 (3), 136-43.Taylor, MC. 2007, ‘Ch 7 Making evidence-based practice work’, *Evidence-Based Practice for Occupational Therapists*, 2nds. Blackwell Science, Oxford. |

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| Module 12.1 Evaluating the evidence-based practice processThe final step in the evidence-based practice process is evaluation. This step, whilst not featuring prominently in some texts on EBP, is extremely critical to the entire process. This is because it is not reasonable to assume that simply because you have attempted to integrate the best available evidence into clinical practice, has the process or outcome of care necessarily improved. The aim of this module is to overview some of the strategies available to evaluate the effectiveness of the evidence-based practice process. It also aims to highlight some of the potential barriers and facilitators to evidence-based practice that you may encounter when you enter the clinical context.**Strategies to evaluate the integration of evidence into clinical practice**A number of strategies are available to evaluate whether best current evidence has been incorporated into clinical decision-making, and the success of this. Baker and Grol (1998) suggest that the following methods may be used:1. Self-evaluation;
2. Clinical audit;
3. Peers within the same organisation conduct a review (peer performance review);
4. Staff from external organisations conduct a review (external practice assessment);
5. Information from significant events;
6. Continuous systematic monitoring.

Sackett et al (2000) provide a good overview of some self-evaluation questions that are useful to consider when assessing the EBP process. They focus on self-evaluation in: * Asking answerable questions
* Finding the best external evidence
* Critically appraising the evidence for its validity and potential usefulness
* Integrating the critical appraisal with clinical expertise and applying the result in clinical practice .

Baker & Grol (1998) provide a description of some other, more formal strategies such as clinical audits and peer review. There are more formal methods of evaluation that would usually be conducted after self evaluation. Suggested Further ReadingBaker, R. & Grol, R. 1998, ‘Ch 7 Evaluating the application of evidence’, In C. Silagy & A. Haines, *Evidence-Based practice in Primary Care*, BMJ Books, London.Sackett, DL. Straus, SE. Richardson, WS. Rosenberg, W. & Haynes, RB. 2000, ‘Ch 9 Evaluation, pp 219-227’, *Evidence-Based Medicine: How to Practice and Teach EBM*, Churchill Livingstone, Edinburgh. |
| Module 12.2 Facilitators and barriers to evidence-based practiceWhilst you have now learnt about the steps involved in the evidence-based practice process, and hopefully feel more confident in applying these skills to practice questions, it is important to recognise that there are both facilitators and barriers to EBP. Incorporating evidence-based practice principles into a clinical environment requires change and involves working closely with your colleagues, clients and organisation. Reading 12.1 is an extract from Chapter 1 of Bury & Mead (1998). It gives a concise summary of some of the barriers and opportunities offered by evidence-based practice. Also, page 134 of Chapter 7 in your text (Taylor, 2007) gives some useful information about barriers to evidence based practice. At this point, it would be useful to read Chapter 7 (reading 12.2) as this gives useful information to guide assignment 3. **Required Reading 12.1** Bury, T. 1998, ‘Ch1 Evidence-based healthcare explained’, In T. Bury & J. Mead *Evidence-Based Healthcare: A Practical Guide for Therapists*, Butterworth, Heineman, Oxford, 22-23. **Required Reading 12.2** Taylor, C. 2007, ‘Ch 7 Making Evidence-Based Practice Work, In C. Taylor, *Evidence-Based Practice for Occupational Therapists*, Blackwell, UK. **☻ Activity 12.2 *Reflection on what research and evidence-based practice means to you****Now that we have reached the end of this course, spend some time reflecting upon what you have learnt about research and evidence-based practice. Brainstorm and write down some words or sentences that describe:* * *What you believe research is;*
* *What you believe evidence-based practice is;*
* *Your expectations and/or desire to engage in EBP and research in the future;*
* *The relationship between research, EBP and the future directions of your specific health profession.*

*Use the space provided below.*Suggested Further Reading Cusick, A. McCluskey, A. 2000, ‘Becoming an evidence-based practitioner through professional development’, *Australian Occupational Therapy Journal*, 47, 159-70.Nicholson, D. 2003. Practice Guidelines, Algorithms and Clinical Pathways. In Law, M. *Evidence Based Rehabilitation*. Slack, New Jersey. ***Congratulations on completing*** ***Research for Health Practice!******Please remember to complete the CEI – you will find a link from the course home page.*** |

Appendix I

# Interview 1

**Questions:**

1. **Can you give me two words which describe how you feel about research and explain your choice?**

Excited and rewarding – anything that extends or challenges existing knowledge is personally and professionally exciting.

1. **Can you tell me about your involvement in research?**

At present, it really involves other people’s efforts and being inspired and challenged. Previously, I was introduced to research methodology and practice when I undertook my Master in Occupational Therapy. I became very interested in looking at human health and occupation from a historical perspective. How did occupation impact on the survival or decline of societies through history? What is the link between archaeology and occupational science? What can we learn about occupation and health in post-industrialised societies, industrialising societies and pre-industrial societies? What are the lessons for today?

1. **How have you developed your research abilities?**

Again, through formal study. Being able to critically read and evaluate information, having a structure on which to develop a research question and proposal, learning how to maximise resources.

1. **What skills and knowledge do you believe are important to research?**

Curiosity (although this is not a skill or a piece of knowledge), organisation, critical thinking, commitment (again not a skill or piece of knowledge), an awareness and understanding of methodologies and different approaches, communication (verbal and non-verbal).

1. **What is the value of research to Occupational Therapy?**
* Extends and challenges existing knowledge and practice
* Confirms credibility in the profession
* A marketing tool to raise awareness and profile of the profession.
1. **What are the limitations of applying research to your practice?**

Any OT is going to benefit from reading up-to-date research and using clinical judgement to see how it might fit into their practice. Time and cost may be factors, depending on the implications – say, if I was going to undertake a study of my clients in private practice, I’d have to build in time and cost in addition to other things.

1. **What does evidence-based practice mean in the context of your clinical practice?**

Basically, that I can show in some way that what I do has a positive impact on the client either through objective measurement of improvement or from subjective feelings/perspectives of the client.

1. **Can you describe your understanding of the relationship between knowledge about research and evidence-based practice?**

Research can help direct or confirm my approaches in therapy. Research can help to build a foundation on which to base what I do. Research can help to determine, describe and explain the kind of evidence I might use to determine the effectiveness of my approach.

# Interview 2

**Questions:**

1. **Can you give me two words which describe how you feel about research and explain your choice?**

Critical – economic imperative to demonstrate the value of our work. Consumers will research effective interventions and will ask more questions in future.

Challenge – clinicians often feel research is not up to them. We need to explore new partnerships between university and health agencies to build opportunities for research.

1. **Can you tell me about your involvement in research?**

Started with an undergraduate project looking at psychosocial indicators of recidivism in psychiatric hospitals. Since then, have explored a number of clinical areas conducting evaluation projects to justify clinical practice in burns, total hip arthroplasty, home-based assessment, manual handling. More recently have conducted an audit of manual handling injuries at Southern Dom Care. Participated in systematic review of in-home rehabilitation.

1. **How have you developed your research abilities?**

Reading research journals, educating self regarding evidence-based practice and use of electronic resources. Working in roles with responsibility in professional development, students and research or evaluation. My partner has also encouraged me to explore research ideas.

1. **What skills and knowledge do you believe are important to research?**
	* Ability to use electronic resources
	* Ability to maintain focus and enthusiasm despite being busy and stressed
	* Ability to build in evaluation/research into daily practice
	* Understand the purpose of good research design
	* Understand the relationship between research design and the results described.
2. **What is the value of research to Occupational Therapy?**

Vital – it will assist us to better describe and explain why we practice in certain ways. It will challenge us to explore new ways of working with clients. It will challenge assumptions regarding efficiency and effectiveness.

1. **What are the limitations of applying research to your practice?**

Encouraging a culture of enquiry, piloting change then embracing new ways of working (this is hard!).

1. **What does evidence-based practice mean in the context of your clinical practice?**

Evidence based-practice means identifying and defining a question regarding practice we want answers on. Exploring the work which has already been done, then being able to rate the reliability of the results described.

1. **Can you describe your understanding of the relationship between knowledge about research and evidence-based practice?**

Evidence based-practice is about being able to take reliable research (judgement based on method) and apply it in my clinical setting. This is a different level of knowledge. Requires understanding of sources of bias and ability to use the resources published already. Knowledge about research is to do with research design and conducting a research project.

Appendix 2 Glossary

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| **Term** | **Definition** |
| Epistemology | The study of how **knowledge** is understood, generated and accepted as genuine. For example, knowledge can be seen as impersonal and objective (empirical stance). |
| Ontology | The understanding of the nature of **reality**. For example, reality can be seen as existing independently of the observer (empirical stance). |
| Empirical research | Research used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena (Leedy & Ormrod, 2005). Other terms: empiricist, experimental, quantitative, positivist |
| Naturalistic research | Research used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants’ point of view (Leedy & Ormrod, 2005). Other terms: qualitative, interpretive, constructivist, post-positivist. |
| Integrated approach | Selecting and combining designs and methods from both traditions (above) so that one complements the other to benefit or contribute to an understanding of the whole (DePoy & Gitlin, 2005, pp31). |
| Variable | A concept or construct to which numerical values are assigned (DePoy & Gitlin, 2005, pp 91). For example: to study drunk driving, one needs to consider variables such as age, time of day, amount of alcohol consumed, complexity of driving task. |
| Dependent variable | This variable is influenced by the independent variable. For example, in drunk driving, alcohol (independent variable) influences your ability to drive (dependent variable). |
| Independent variable | This variable influences the dependent variable. Almost always precedes the dependent variable. |
| Confounding variable | Variable that has an effect on the study variables but is not necessarily the object of the study (DePoy & Gitlin, 2005, pp 92). Other term: intervening or extraneous variable. |
| Hypotheses | A statement that indicates what the researcher expects to find. Statement needs to be verified or falsified by the research process (DePoy & Gitlin, 2005, pp 92). It includes the variables under investigation. |
| Transferability | The ability to transfer naturalistic research findings to other similar contexts. See DePoy & Gitlin, 2005, pp 102. |
| Flexibility | A characteristic of naturalist research. It is expected that the procedures and plans for conducting this type of research will change as the research proceeds (DePoy & Gitlin, 2005, pp 102). Research procedures change as a consequence of the emerging data. |
| Emic perspective | The insider’s/ informant’s way of understanding the experience (DePoy & Gitlin, 2005, pp 103). |
| Etic perspective | The outsider point of view – those who are outside the group/ phenomenon under investigation, are used as informants. See DePoy & Gitlin, 2005, pp 103. |
| Bias | The potential unintended or unavoidable effect on study outcomes. Factors which influence a study’s results. Can be due to the researcher’s own perspective, the specific sample selected, the research instruments selected, etc. See DePoy & Gitlin, 2005, pp 93. |
| Reliability | The ability to get repeated similar results when repeating the exact study procedures. See DePoy & Gitlin, 2005, pp 99. |
| Validity | The extent to which your findings are accurate. Types: internal, external, statistical conclusion & construct. See DePoy & Gitlin, 2005, pp 95. |
| Generalisability | Or external validity. The capacity to generalise findings of the study and develop inferences from the study’s sample to the broader study population from which it originated. See DePoy & Gitlin, 2005, pp 97. |
| Conceptual definition | A concept described/ expressed in words |
| Operational definition | How the concept will be used/ applied in the research project |
| Reliability | The ability to get repeated similar results when repeating the exact study procedures. See DePoy & Gitlin, 2005, pp 99. |
| Validity | The extent to which your findings are accurate. Types: internal, external, statistical conclusion & construct. See DePoy & Gitlin, 2005, pp 95. |
| Deductive reasoning | Moving from a general principle to understanding the specific, for example a researcher starts with a hypotheses re the existence of relationship between 2 variables, then sets out to test it – and finds that it exists/ does not exist. |
| Inductive reasoning | Moving from a specific observation to a general principle, for example a researcher will observe a specific occurrence and generalise its principles to the larger population. Used during naturalistic studies.  |
| Randomisation | Assigning participants to a sample by chance. |
| Manipulation | When one or more variables are changed in some way in a research study, to study its effect. |
| Control | The measures that a researcher takes to ensure all other confounding variables are held constant/ are not influencing the study’s results.  |
| Nominal data | Numbers that identify the names of variables |
| Ordinal data | Numbers that assign an order to a set of variables |
| Interval data | Numbers that share the characteristics of nominal and ordinal data and has equal spacing between categories |
| Ratio data | Numbers that have all the characteristics of interval data but also have an absolute zero point. |
| Trustworthiness | Term used in naturalistic research to indicate the research project’s findings as fair and complete representation of the phenomenon – this term is preferred to more empirical terms such as objectivity. |