

UNDERSTANDING NURSING AND HEALTHCARE RESEARCH

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What is Research?

Introduction

This book is designed as an introductory text that will facilitate your understanding of research. Undertaking research is a skilled activity and while it is desirable that practitioners engage in research this is not the purpose of this book. This book is focussed on introducing you to research so that you can become research aware. Being research aware is about developing the skills that will enable you to read and understand research reports. While this may seem straightforward, understanding research means possessing the skills to make judgements about the quality of that research and determining if the findings are sufficiently credible to warrant implementation in practice. In order to do this you must know about each step of the research process and be able to decide if the study has been conducted in the way it should have been. Understanding research is a fundamental and necessary skill for all healthcare practitioners because we have to be sure that the care and treatment of those in our care is based on the best available evidence. As will be shown further on in this chapter, research evidence is a key element of evidence-based practice. Much of the content will be directed at what is known as ‘applied’ research, that is, research that has application to clinical practice.

This introductory chapter sets the scene for subsequent chapters. This is because we believe if you have some insight into the history of research you are more likely to understand why it has developed in the way it has. Some of the concepts that are presented will be new to you and it may take several readings to understand the more complex of these. The chapter begins by offering a brief definition of research. Subsequent sections outline the relationship between research and knowledge, research and theory and research and practice. The chapter concludes by exploring the importance of becoming research aware and how this is ultimately related to research utilisation in practice.

✓ Learning Outcomes ✓

By the end of this chapter you should be able to:

- Explain what is meant by research
- Outline the relationship between research and knowledge
- Describe how theory and research are related
- Summarise how research is important for clinical practice
- Identify what it means to be research aware.

What is Research?

The word ‘research’ originates in the Old French ‘recercher’ which means to ‘seek out, search closely’. It appeared in the English language in the seventeenth century and was taken to mean ‘a careful search for facts’. Although we commonly use the word in our everyday language, for example, ‘I researched the options for our holiday’ its primary usage is in the world of science where its meaning remains closely linked with its original seventeenth century conception. Contemporary research can be said to be concerned with examining, looking closely or scrutinising an issue of interest for the purpose of better understanding. This may ultimately lead to a refinement, validation or refutation of current knowledge and/or the creation of new knowledge. Research in this context is referred to as empirical research and is synonymous with the use of a structured method. There are two key points that emerge here. The first is concerned with the question of what constitutes knowledge and the second is about the use of a structured method.

Knowledge and Research

In considering the first point, the study of knowledge, its history, its origins and the criteria for what counts as knowledge is a branch of philosophy known as ‘epistemology’. Epistemological questions such as ‘what is knowledge’ and ‘what is truth’ have challenged and even vexed philosophers since the time of early Greek philosophers such as Plato and Aristotle (Steup, 2012). There have been sharp disagreements about what knowledge is and what counts as knowledge and seeking answers to these questions has been and remains fraught with difficulty.

However, what has emerged is an agreement that there are different types of knowledge. Although we accept much of what we know as a given and consequently do not afford it much thought, there is little doubt that we all know many things about the world in which we live. Moreover, our knowledge is changing and expanding all the time depending on what we read, what we experience or what we are told. We not only know *about* people, places and things, we know *how to do* things such as ride a bicycle, play a piano, dance, read and sing. We also experience the world and come to know things such as sadness, happiness and pain through those experiences. All of these constitute different kinds of knowledge that make up all of what we know.

These types of knowledge have been variously classified but most commonly include propositional, procedural and personal knowledge. Propositional knowledge or ‘knowledge that’ is that knowledge we have when we say that ‘such and such is the case’. Propositional knowledge includes the knowledge of theories, facts and laws. For example, when we say we know each key on a piano denotes a musical note we are speaking of propositional knowledge.

However, knowing this does not mean that we possess the necessary skills to play the piano. The knowledge of *how* to do something is signified as procedural knowledge and can only be developed by learning through doing. Thus, exposure and experience is central to developing procedural knowledge although it is important to note that procedural knowledge may entail some propositional knowledge.

The third type of knowledge identified by epistemologists is personal knowing, which has also been described as ‘knowledge by acquaintance’ and is the knowledge that we have by virtue of having experienced something. For instance, we can only know pain by having experienced it. However, for it to be considered knowledge, we must be able to determine that what we are experiencing is indeed pain and for this we need to have some propositional knowledge of the concept of pain. As with procedural knowledge it seems that personal knowledge also involves possessing some propositional knowledge.

Consider the three types of knowledge above in respect of the activity of recording of a person’s blood pressure. See if you can identify:

- The propositional knowledge (theories) that underpins the activity, i.e. why is it done, what does it tell us and why is that important?
 - The procedural knowledge that you would need to be able to complete the activity. How do you acquire this knowledge?
 - Any personal knowledge you have regarding the activity, e.g. have you had your blood pressure recorded and what do you think you learned from this experience?
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ACTIVITY 1.1

If, as can be seen from the above outline, procedural knowledge is associated with learning from doing and personal knowledge arises from our experiences of the world, how do we acquire propositional knowledge? Even though philosophers concerned with epistemology acknowledge procedural and personal knowledge, their primary focus is on propositional knowledge and how it is developed. Philosophically speaking there are two opposing traditions about our sources of knowledge that are known as rationalism and empiricism.

Rationalism essentially argues that propositional knowledge comes to us through the use of reason. The basic premise is that our minds generate knowledge because of our ability to think. Philosophers such as Descartes who was a key figure in rationalism believed that we could not trust what our senses were telling us. He argued that because there were so many ways of interpreting reality we could only be sure of our own thinking. His famous phrase ‘I think, therefore I am’ comes from this belief.

Conversely, empiricism is located in the belief that we are born with a ‘tabula rasa’ (blank slate) and our knowledge is derived from our experiences of the world. The

notion of a 'tabula rasa' was first proposed by Aristotle and subsequently developed by a group of philosophers including the prominent English philosopher John Locke. He argued that our experiences consist of two parts, namely sensation and reflection. Our sensations happen through our senses of sight, hearing, taste, touch and smell and reflection is about how we interpret those experiences, which suggests that reasoning does play a part in how we make sense of things.

Nowadays, these positions would be seen to represent extremes and it would be unusual to find a philosopher who believes that knowledge is solely developed through reason or experience. Modern philosophy of science is less polarised and there is recognition that rationalism and empiricism both contribute to the development of propositional knowledge through the practical endeavour of undertaking research.

Philosophers are concerned about establishing the truth of things and in order to do this they had to develop methods that would help determine with as much certainty as possible if something was true. These methods varied depending on whether the philosopher was a rationalist or empiricist. For example, and as stated above, empiricism is concerned with the belief that knowledge comes from our experiences of the world. Therefore, the methods developed for establishing 'truth' are located in observing and measuring those experiences.

During the Renaissance and the Enlightenment period that followed, these approaches became the cornerstones of the methods used to establish the truth. Fundamentally, knowledge is amassed through repeated observation and measurement of particular instances of a phenomenon. The key approach to observing and measuring is the experiment where the purpose is to establish cause and effect and generalise the findings to the wider world. This process may begin to show general patterns, which ultimately result in building or generating theories that describe, explain or predict part of our world. Although this method, known as induction (bottom-up), has evolved and developed since the Enlightenment, characteristics such as measurement, the generalisation of findings to the wider world and the use of the experiment remain central to the work of researchers today.

The competing method, known as deduction (top-down) and located in rationalism and the work of Descartes works the other way and begins with a general principle, which is then applied to a specific situation. This method is also evident in contemporary research whereby researchers begin with a theory about some phenomenon. The theory may come from repeated observations about the phenomenon or topic of interest. It is then tested through research (see Figure 1.1). The researcher develops propositions (hypotheses) from the theory, which are then tested in specific situations. The outcome or the findings of the study will indicate whether the theory is valid or whether it can be refuted. This approach is broadly classified as theory testing.

Theory and Research

The important distinction between the two approaches outlined above is whether or not the researcher *begins* with a theory or *ends* with a theory. Regardless of which approach is taken or even if there is, as there are in some studies, a combination of both, the outcome

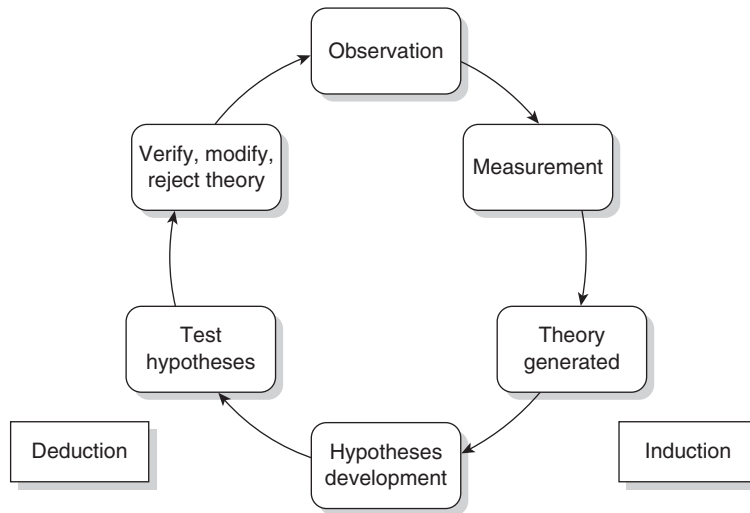


Figure 1.1 Inductive/deductive research cycle

is always about theory. Theories are those things that tie together all the propositional knowledge we have about a topic of interest and offer explanations for why something is the way it is. Thus, the ultimate aim of all scientific research is to devise theories that describe, explain, predict or control aspects of our world. The more the findings of research support the theory, the more certain we can be that it is true. Conversely, through research, theories can be found to be false and are rejected and in many cases replaced with alternative explanations that are a more accurate reflection of reality.

In many areas, competing theories exist and it is only with repeated research that one *may* emerge as having more explanatory value. For instance, there are a number of competing theories about why people commit crime. For the purposes of illustration two are mentioned here because of their quite different perspectives. The biological, genetic and evolution theory proposes that issues such as poor diet, mental illness, disorders of brain circuits are factors in whether or not somebody becomes involved in crime. Conversely, social learning theory argues that people develop a motivation to commit crime because of those with whom they associate. Determining which theory has more validity will depend, to some extent, on how much and what kind of evidence there is to support it.

While this may appear quite straightforward, there are factors that influence the type of research that is undertaken. For example, a biologist will undertake research that is directed at trying to establish if biology and genetics explain crime while a psychologist who supports social learning theory will strive to demonstrate that those with whom we associate is a motivating factor in committing crime. Either or both positions will only change when there is overwhelming evidence to support or refute a particular stance.

Even if it is ultimately shown that one theory has more explanatory value than another there are very few theories that are absolutely certain and they are always changing and evolving. Although simplified here, a good example of how theories evolve and change

is the claim by Copernicus in the sixteenth century that the earth orbited the sun. While we might find it hard to comprehend today that this was ever in dispute, we should consider both the context in which the claim was made and the means that were available to verify the claim. Copernicus was an astronomer but he was only able to make observations of the sky with the naked eye as the telescope had not been invented. It was with its subsequent development that Galileo was able to confirm the accuracy of Copernicus' theory. Although there have been subsequent modifications of the theory, much of what Copernicus proposed has stood the test of time.

In terms of how readily Copernicus' theory was accepted, the context in which it was proposed is important. At the time, the Church in Rome had the power to determine what was accepted as theory or knowledge. Challenging its teachings, which were based on Aristotelian principles that the earth was static and the sun orbited it was a dangerous endeavour and for some led to charges of heresy and even death. Therefore, it was sometime after Copernicus' death that his theory was accepted.

There are some salient points to be noted in relation to this very brief discussion about theory and research. Primarily, it would be naïve of us to think that undertaking research and developing theories is context free. Members of a scientific community who undertake research tend to have collective beliefs and a common view of the world. What this means is that people who belong to the same community of scientists share beliefs about what constitutes knowledge, what theories they regard as valid and how research is or should be undertaken. Moreover, because of these commonly-held beliefs and views the research they conduct will likely serve to perpetuate that view or maintain the status quo. Kuhn (1970), a physicist, coined the term 'paradigm' to describe these underlying assumptions and the intellectual structure of scientific communities that drives research and development within them. So, if a researcher is a member of a community that subscribes to a biological view of why people commit crime then it is likely that he/she will also hold such a view.

The second point is related to what can be referred to as the prevailing view. While it is unlikely that modern day theorists and researchers would be burned at the stake, there is a legacy in terms of the notion that those who are in power or those who are seen to be powerful have the capacity to dictate and determine what counts as knowledge. Furthermore, those who are powerful influence what aspects of our lives deserve investigation. Therefore, while researchers may develop knowledge about topics they consider worthy, if it is not deemed to be so by powerful scientific communities it is unlikely to receive any attention.

The final point may seem self-evident but it is that knowledge development through research is facilitated or constrained by the means we have at our disposal. Remember Copernicus' lack of a telescope. Many of the research advances in the twentieth century have been facilitated by the phenomenal developments in technology. Our capacity for investigating phenomena of interest, the way in which we conduct research, how we manage the findings of research and our ability to disseminate those findings to a wide audience have been revolutionised.

Practice and Research

At this stage, you may be asking what all of this has to do with what we do as practitioners in healthcare. In healthcare practice, the underlying premise of our

work is that we have a professional obligation to try to provide the best care possible based on the best available knowledge and evidence. Knowledge generated from research is one form of evidence and within the community of healthcare, research is undertaken to generate and test theories about health and illness with the aim of applying that knowledge for the ultimate benefit of those for whom we care.

In contemporary healthcare there is almost universal recognition from practitioners, managers and policy-makers that in order to deliver effective healthcare, scientific evidence is an essential element (Coughlan et al., 2013). This element, combined with the expertise of the clinician and the needs of the individual patient comprise clinical decision-making that is designed to introduce consistency in terms of care and treatment so that patient outcomes and quality of life can be improved. This model of clinical decision-making is known as evidence-based practice (EBP) (Sackett et al., 1996; Muir Gray, 2001).

The inclusion of sound scientific (research) evidence into clinical decision-making reduces the emphasis on what Guyatt et al. (2004: 390) described as 'unsystematic clinical experience and pathophysiological rationale'. In other words, external research evidence reduces the potential for practice based on individual preference or ritual that may not be in the patient's best interests.

This brings us to the question of what constitutes best research evidence. In this, the history of knowledge development has had a significant influence because characteristics of the scientific method alluded to earlier such as objectivity, measurement, generalisation, hypothesis testing and the use of the experiment are still considered to be central to the conduct of research that produces findings that are seen to be more reliable than research that does not contain them. Put more simply, the belief is that some research designs produce more reliable results than others. Thus, with the emergence of EBP, hierarchies of evidence have been developed.

In healthcare, much research is undertaken to find out what works best and these can be broadly classified as intervention studies. For these types of projects, the findings from randomised controlled trials (RCTs) (see Chapter 5) that are used to assess the effectiveness of clinical interventions, such as in the area of drugs or surgery, are generally considered to be the most reliable form of evidence. This is because in a randomised controlled trial the characteristics of the scientific method mentioned above are adopted to ensure that the results of the study can be attributed to the intervention being investigated as opposed to any other potential influence or variable. The less these characteristics are contained in a study the less reliable its findings are deemed to be. This is not to say that the findings of these other types of study are of no use but they are believed to be less 'certain'.

However, healthcare is complex, has a wide scope and is not just about clinical interventions. Therefore, other forms of research evidence are important in enabling us to gain a greater understanding of the illness experiences of patients and clients. For example, a randomised controlled trial can examine the effectiveness of a new medication but research evidence gained from qualitative studies is needed in order for us to determine how patients feel the medication impacts on their lives. Moreover, it could be that despite an intervention being clinically effective it may work differently or not at all depending on the individual, social, economic and environmental circumstances in which it is being implemented. Therefore, it is not appropriate to take the findings of a study and implement them without first determining how it works, how well it works, for whom it works and in what

situation. What this means is that research evidence on its own is not sufficient for, and does not account for, the whole of clinical decision-making. This then speaks to the other two elements of EBP, namely, clinical expertise and the needs of the patient.

According to Gerrish (2010) clinical expertise is proficiency gained through experience. The inclusion of the word proficiency is important because as Rolfe (1999) states, the knowledge gained from experience may not always be used wisely or appropriately. Therefore, to have expertise means to be able to apply that knowledge 'wisely' to the care and treatment of patients.

Knowledge accumulated from experience is termed experiential knowledge and comprises the procedural and personal knowledge referred to earlier in this chapter. While there is some debate in the literature about whether experiential knowledge can constitute evidence (Hek & Moule, 2006; Rolfe & Gardner, 2006; Gerrish, 2010) it is clear that the experiential knowledge of the clinical expert is an essential element of EBP. Moreover, knowing the patient's needs and engaging with them to determine their preferences is fundamental. These three elements have an interdependent relationship that forms the whole of EBP with the underlying premise being that clinical decision-making should not be based exclusively on any one of the elements but on an amalgamation of all three.

While this model for clinical decision-making appears laudable there are a number of significant issues that impact on how research evidence as a component of EBP is utilised or translated into practice. Since as early as 1990 there have been a large number of publications in the healthcare literature addressing facilitators and barriers to research utilisation across a range of professions and settings (Bircumshaw, 1990; Parahoo, 2000; Hutchinson & Johnston, 2004; Milner et al., 2006; Thompson et al., 2008; Brown et al., 2010; Chien, 2010; Kocaman et al., 2010; Cobban & Profetto-McGrath, 2011; Lyons et al., 2011; Moreno-Casbas et al., 2011; Wangansteen et al., 2011; Christie et al., 2012; Chen et al., 2013;). While these publications address a variety of organisational or contextual issues, a consistent finding has been that even though healthcare professionals demonstrate a positive attitude towards research, there exists a lack of confidence in their research knowledge and in their ability to appraise research reports (Gerrish et al., 2008; Lyons et al.; 2011).

In the process of translating research findings into practice, a key step is determining if those findings *should* be implemented. This is no easy task given that contemporary healthcare is highly-pressured, complex and resource restricted. Moreover, technological advances and the explosion of available knowledge mean that the sheer volume of available research on a vast array of topics is itself a barrier to translation to practice. Even searching and locating appropriate research is a highly skilled activity. In addition, research with its ever expanding range of methodologies and methods is becoming increasingly complex. Yet, we would argue that this increasing complexity and unlimited access to research makes the ability to analyse and interpret research even more important for deciding best practice in any given situation. In order to do this healthcare practitioners must understand and have knowledge of research and the research process and possess the skills to make judgements about its quality and the significance of its findings for practice. Becoming research aware is the first step in developing the skills to make these judgements.

Becoming Research Aware

In our modern world, it could be said that the majority of people have some level of awareness of healthcare research. This is because most weeks there are reports in the popular media about the findings of studies related to disease processes, treatments, and therapies that are deemed to be of interest to the general public. Some topics are considered more newsworthy than others because of their perceived importance to the health of society but they represent only a fraction of the research studies that are being conducted in healthcare. For example, if the findings of a research study point to actual or possible developments in the treatment of cancer, it is likely that it will receive considerable attention. A key point, however, is that reports in the media are just that and they tend to focus on the results of the study rather than if the study was well conducted and therefore if the results are credible. Thus, there is a distinct difference between awareness of the results of studies and being research aware as a practitioner of healthcare. As indicated above, healthcare practitioners must not only be aware of the research that is being conducted within their field of interest but must also possess the skills to make judgements about the quality of that research. This is not easy and considerable effort is needed to develop research literacy.

However, when students of healthcare are introduced to research in their undergraduate programmes many find it difficult to see what it has to do with practice. Sometimes practitioners and students are fearful of research and do not understand the terminology. Doing research can be seen as an elitist activity and at times the manner in which it is presented in academic journals perpetuates this perception.

Yet, research awareness does not necessarily mean undertaking the research yourself but it does mean being able to analyse the components of various research studies in order to determine what is good research and therefore what has most applicability for our patients. To do this, we must develop an understanding of the research process and what is required at each stage. This includes being cognisant of the language of research, the methodologies, research designs, methods of data collection and data analysis, determinants of quality, ethical issues and factors related to dissemination and application or implementation of the findings. This is important because research is not determined as being 'good' simply by virtue of its focus. There are potentially innumerable topics in healthcare research that are worthy of study. However, it is the manner in which the question is posed and how well the methodologies and methods that are employed to undertake it that determines ultimately if it is good research (Ellis, 2010).

Knowing how to appraise research reports is a significant precursor to research utilisation, which is defined by Estabrooks (1999a) as the transformation of findings into interventions that can be used in practice. Studies have measured and confirmed three forms of research utilisation (conceptual, instrumental and persuasive) among nurses (Estabrooks, 1999a, 1999b; Profetto-McGrath et al., 2003; Kenny, 2005; Milner et al., 2005; Forsman et al., 2009; Wangensteen et al., 2011). Conceptual research utilisation refers to changes of opinion or changes in how the nurse thinks about a particular clinical situation because of research although it may not result in a direct change in action. Instrumental (direct) research utilisation is about the concrete application of

research findings such as in practice or policy guidelines. Finally, persuasive research utilisation refers to the use of research to persuade others, usually those who make decisions, to make changes to policies, practices or conditions pertaining to nurses, patients and/or the health of individuals or groups (Estabrooks, 1999a). Conceptual and instrumental research utilisation are used more often among nurses than persuasive research utilisation.

These studies have found, however, that overall research utilisation among qualified nurses is low despite the emphasis on appraisal and use of research evidence in undergraduate study. Furthermore, Forsman et al. (2009) found a decrease in research utilisation among practitioners who were three years post-graduation compared with those who were one year post-graduation. While these studies do not focus on organisational or situational factors such as environment, resources and time (Gerrish et al., 2008) that facilitate or hamper research utilisation, they do identify individual determinants. These factors are seen to be of considerable importance and include knowledge of and attitude towards research utilisation, as well as critical thinking skills such as being open-minded, inquisitive and systematic. The greater the number of practitioners who have a strong individual commitment to research utilisation the more likely it may be that a supportive environment for research utilisation will emerge.

Thus, becoming research aware is the beginning of a long-term commitment to research utilisation for the ultimate benefit of those for whom we care. While we can never know all there is to know about research or even the focus of that research we can contribute to creating healthcare environments that enable practitioners to utilise research evidence.

Chapter Summary

This introductory chapter has provided the historical context for the subsequent chapters of this book. Research was defined as being concerned with scrutinising an issue of interest using a structured method for the purpose of refinement, validation or refutation of current knowledge and/or the creation of new knowledge. The focus of research as the development of propositional knowledge was outlined within the context of the branch of philosophy known as epistemology. The relationships between research and knowledge, research and theory and research and practice were outlined and incorporated consideration of issues such as the influence of epistemology on the development of knowledge and the impact of philosophical thinking on approaches to theory development. The importance of scientific evidence from research as one element of evidence-based practice was presented with other essential elements being identified as individual clinical expertise and the needs of the individual patient. The chapter concluded by exploring the importance of becoming research aware, the skills needed to be research aware and how this is related to research utilisation in practice.

 **Key Points** 

- Contemporary research is concerned with examining or scrutinising an issue of interest which may lead to refinement, validation or refutation of current knowledge and/or the creation of new knowledge.
- Research is referred to as empirical research and is synonymous with the conscious application of a structured method.
- There are different types of knowledge that can be broadly classified into propositional, procedural and personal knowledge.
- The focus of research is the development of propositional knowledge.
- There are two opposing philosophical traditions known as rationalism and empiricism. These have resulted in inductive (bottom-up) and deductive (top-down) approaches to undertaking research.
- The ultimate aim of all scientific research is to devise theories that describe, explain, predict or control aspects of the world.
- Knowledge generated from research is one form of evidence.
- Scientific evidence, clinical expertise and the needs of the individual patient comprise evidence-based practice (EBP).
- Research awareness means being able to analyse the components of various research studies.

Useful Online Resources

www.socialresearchmethods.net/kb/dedind.php
www.medicine.ox.ac.uk/bandolier/