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The relationship between research question and research design

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Chapter 6

The relationship between research question and research design

1. Introduction

The whole emphasis of this book is to enable you to develop the skills needed to critically evaluate the research you read, so that this critical utilisation of research might inform the development of your clinical practice. This chapter is concerned with the relationship between the question the research sets out to answer, and the research design used to answer this question. This association between question and design is fundamental to the whole research process, because if an inappropriate design has been used to answer a research question, the quality of the research project will be fundamentally undermined. As the utility of any research depends on its quality and purpose (Closs and Cheater 1999), it is therefore important that a particular research question is matched with an appropriate design. So the 'fit' between research question and research design underpins the whole foundation of the research process, and this chapter will explore the nature of this relationship.

The chapter is organised into two major sections. The first will explore what is meant by the term the 'research question', and will explore

issues such as 'What do we mean by a research question?', 'What is the purpose of the research?', 'What is it that the researcher wants to know?', 'What is known already?', and 'What type of knowledge will be generated'. The second section will examine what is meant by 'research design' and will provide an overview of the major different types of design, their strengths and limitations. The conclusion will bring these elements together and highlight the key issues you need to consider when reading research papers.

Activity 6.1

Take a few moments to consider the terms 'research question' and 'research design'. From your knowledge of research so far, brainstorm what you think these terms mean and note down your thoughts. We shall return to this activity later in the chapter.

1. The research question

In response to Activity 6.1, you may have noted that, very simply, a research question is the essence of what the researcher wants to know or the question they want to answer. Parahoo (1997, p.396) defines the research question as 'the broad question which is set at the start of a study'. The centrality of the research question to the whole research process is outlined by Rees (1997, p.8) who suggests that 'research consists of extending knowledge and understanding through a carefully structured systematic process of collecting information which answers a specific question in a way that is as objective and accurate as possible'.

The overall purpose of the research is therefore to find an answer to the research question. An appropriate and well-executed research design ensures that this is done in the most rigorous way possible. So, at the outset of a study, the researcher outlines what it is they want to know. In the current climate of evidence-based practice, perhaps the researcher is interested in finding the most clinically and cost effective way of delivering care in a particular setting. In this instance, the research question should be tightly focussed, that is, it should be extremely clear exactly what aspect of practice the researcher is investigating and with which population of patients or clients. Or perhaps the researcher is interested in exploring the experience of a specific group of patients living with a particular chronic disease. In this kind of study the research question may well be somewhat broader, as the researcher is unsure exactly what type of answers they might uncover. These are examples of very different research questions, which as we shall see, require different research designs to answer them.

Activity 6.2

Take a few moments to think about your clinical practice. No doubt there are areas of this practice that interest you and which you would like to explore in more detail. Perhaps you have already thought about some of these in detail, during your reading of the research literature or from discussion with colleagues. You might of course find answers to your queries by conducting a critical literature review. However, for the purpose of this activity, imagine that there is insufficient evidence available. How

would you go about researching your topic? What might your research question be?

Developing a 'good' research question can be quite difficult, as perhaps Exercise 6.2 demonstrated. The question needs to be clear and well articulated so that there is no doubt about what it is the researcher wants to know. Cormack and Benton (1996) distinguish between two types of research question - interrogative and declarative. An interrogative research question is expressed as a question and alludes to a gap in healthcare knowledge. An example might be 'What is the experience of older people following discharge from hospital?' A declarative research question is a statement that clearly defines the purpose of the study. For example, 'The purpose of this study is to examine the relationship between systematic discharge preparations and hospital readmission rates in a group of older people'.

Whatever style of research question adopted by a researcher, the question should be clearly expressed and, normally tightly focussed. A woolly or fuzzy question will lead to a woolly and fuzzy answer.

2. Levels of knowledge

[Margin link to previous chapter] The development of the research question is determined by the type of knowledge the researcher is intending to generate. Different types of research questions will generate different

types of knowledge, so the way in which the research question is expressed will be dependent upon whether the researcher is seeking to generate either descriptive, explanatory or predictive knowledge.

When little is known about a topic, research can be designed which provides a detailed description of the topic, which generates descriptive knowledge. Research approaches which develop this type of knowledge can be either quantitative or qualitative but are more likely to be qualitative, as these methods more frequently, although not exclusively, allow detailed exploration of a particular topic. The question might also be interrogative in nature, for example 'What is women's experience of living with cervical cancer?'.

When a researcher is interested in explaining the relationship between different components of a specific topic, then explanatory knowledge will be generated. There is usually some knowledge already available on a number of aspects of this topic, and so new research is designed to further explore relationships between the various components of this knowledge. Research questions are more likely to be declarative, for example 'The purpose of this study is to examine the relationship between surgical pre-assessment and post-operative pain' and research methods are most likely to be quantitative, such as surveys. Descriptive and inferential statistics are frequently used to explore the nature of the relationships between the variables identified in the research question.

When descriptive and explanatory knowledge about a topic is already available, a researcher may want to know whether some of these variables have a cause and effect relationship. In this instance, predictive knowledge is generated. Predictive knowledge is often regarded as the strongest form of knowledge and is concerned with confirming or rejecting cause and effect relationships, so X will/will not have Y effect on Z. For example, does a pre-admission home visit to women booked for planned hysterectomy lead to improved psycho-social functioning post-operatively? Experimental research is the methodology of choice here, as only a well-controlled experiment, such as a randomised controlled trial, will confidently establish such links.

2. What is known already?

The previous chapter suggested that research studies should build upon an existing body of knowledge. So, any new research study should develop what is already known, however limited this knowledge might be. For research intending to generate descriptive knowledge, it is likely that there will be less existing research available than for research proposing to develop explanatory or predictive knowledge. However, irrespective of the amount of existing knowledge available, prior to devising a research question, the researcher must examine what evidence already exists with respect to their area of enquiry. Awareness of existing knowledge may well inform the way in which the researcher proposes to proceed with the

research. (As we shall see later, grounded theory can be an exception to this approach).

[In margin cross reference to Chapter 11] It is normal therefore that a literature review will be undertaken. Literature reviews fulfil a number of purposes including satisfying professional curiosity on a subject, locating evidence to inform practice development and finding solutions to immediate practice problems. In the context of this chapter, literature reviews are central to locating existing knowledge which might suggest directions for future research (Talbot 1995). There are however a number of limitations associated with literature reviews and awareness of these is important, as they may have a bearing on the development of the research question. Cullum (1994) suggests that the following can be common problems with literature reviews: frequently reviews are insufficiently critical; the process for selecting and including material in the review is often unclear; there can be bias in favour of studies that demonstrate positive findings; and insufficient information is provided about the review process in general. In addition, implications for practice and for future research are sometimes inadequately explored.

As a result of these limitations the methodology of systematic reviews has developed over the last 10 to 15 years, to make more rigorous the whole process of literature reviewing. Systematic reviews differ from conventional critical literature reviews because they follow a 'strict scientific design in order to make them more comprehensive, to minimise the chance

of bias, and so ensure their reliability. Rather than reflecting the views of the authors or being based on only a (possibly biased) selection of the published literature, they contain a comprehensive summary of the available evidence' (CRD Report 4, 1996: i).

Where it exists then, reference to knowledge made available by the process of systematic reviewing is likely to indicate that a researcher has attempted to seek out the most rigorous knowledge available on the topic. However, despite their clear benefits to healthcare practice and their high profile in current research and development policy, systematic literature reviews have also received criticism. This is due in large part to their reliance on evidence generated via randomised controlled trials (see below) and their subsequent exclusion of evidence produced by other forms of research. I will return to this debate a little later in this chapter.

2. The influence of the researcher

It can be seen from the discussion so far, that development of the research question is determined in response to a number of questions. What is the purpose of the research? What is it that the researcher wants to know? What type of knowledge is going to be generated? What is known already? So although framing of the research question is arguably the first hurdle to overcome, there are a series of preparatory stages the researcher must first negotiate.

It is important to acknowledge therefore, that even this very first step in the research process is very much influenced by the researcher. Although the research question may appear 'objective' and 'scientific', particularly in the context of quantitative methods, it is important to remember that the question has not been conceived in a vacuum. Researchers do not 'arrive empty minded in the field' (James 1993, p.67) but bring to the project their own beliefs and interests, which are influenced by their position in the world, their previous experience of research including perhaps favoured ways of conducting research. Therefore, throughout the research process, including the development of the research question, the researcher is not a 'neutral spectator' (Denzin 1997, p.35) who is abstracted and distanced from the research. Rather, their influence is woven throughout the project from inception to execution, analysis and presentation. Research design may attempt to remove traces of the researcher's existence, but their presence in and influence over the creation of the project (whether in the natural or social sciences) determines the framing of the research question, the methodological approach taken and ultimately the nature of the knowledge generated. So any investigation can never be devoid of the influence of the investigator (Koch and Harrington 1998). Carson and Fairbairn (2002, p.25) argue that:

'Research questions are not grasped out of thin air but are the choice of the researchers in the field. Questions are developed from a particular theoretical perspective that a researcher chooses, and answers to these questions relate directly back to the research's theoretical perspective; the

choice of research question will have a direct influence on the answers received'.

2. Summary

It is really important when reading published research to be able to clearly identify the purpose of the study and what the researcher is attempting to find out. This is most often expressed as a research question or an aim or objective. For some studies using quantitative methods the purpose of the research is expressed in terms of a hypothesis, which is 'a tentative statement, in one sentence, about the relationship, if any, between two or more variables' (Parahoo 1997, p.126). Hypotheses should include reference to, not only the variables and the relationship between them, but also the population involved in the study.

The researcher has a responsibility at the outset of a research report or paper to make this question clear. This may seem obvious and simple, but sometimes the research question is 'buried' away in the paper and is not obvious at all. If this is the case, as critical readers of research, we cannot make an accurate assessment of the methodology and methods used, if we are unclear about the overall purpose of the research (Parahoo 1997). This makes our role as critical readers more difficult (Long 2002).

Activity 6.3

Now that we have discussed the nature of the research question and some of the factors that determine its development in more detail, it is time to put this knowledge into action. Select a number of published papers reporting empirical research projects on topics that are of interest to you. Examine the research questions identified by the authors with reference to the following:

- *What is the purpose of the research?*
- *What is it that the researcher wants to know?*
- *What type of knowledge is going to be generated?*
- *What is known already?*
- *What is the influence of the researcher?*

[In margin cross reference to research questions identified in previous chapter, Exercise 4.1]

Some examples of hypothetical research questions have been included below. We will return to these research questions in the section which follows, during our examination of some of the major research designs.

Research questions

1. What are men's experiences of the transition to contemporary fatherhood?
2. What are older women's experiences of becoming widows?
3. Is there a relationship between undertaking an in-house training programme on effective pain management and the quality of pain control on a hospital ward?

4. Is there a relationship between parental attendance in the anaesthetic room and subsequent length of hospital stay for the child following tonsillectomy?
5. Does restricted use of restraint lead to increased rates of falls in older people in a residential setting?

1. Research design

The research design is the overall plan of how the researcher intends to implement the project in practice. Parahoo (1997, p.142) defines the research design as 'a plan that describes how, when and where data are to be collected and analysed'. The design also includes details 'for enhancing the internal and external validity of the study' (Polit and Hungler 1991, p.653). It includes a description of how the sample is to be identified and recruited, ethical considerations, confidentiality, anonymity, access to the research site, how the data are to be collected and analysed, and plans the researcher has for disseminating the findings of the study. So, in essence, the research design is concerned with the practical arrangements of getting an answer to the research question.

Research design is an umbrella term which encompasses the two concepts of 'research methodology' and 'research methods', terms which are frequently used interchangeably in the literature. Methodology is the overall research approach chosen by the researcher, for example whether experimental, survey, ethnography, phenomenology, grounded theory,

action research or participatory research. Different research methodologies are influenced by different research perspectives or paradigms. Research method refers to the practical ways in which the researcher intends to collect and analyse data. In quantitative methods these include structured questionnaires, rating scales, structured observation and in qualitative methods semi-structured or un-structured interviews, participant observation, narrative analysis and content analysis.

As we have already seen, research can generate different forms of knowledge (descriptive, explanatory or predictive) and it is the combination of a clear and focussed research question with the most appropriate research design, that is responsible for the level of knowledge generated. Some questions will be so specific that only one design will be appropriate, whilst other questions will be more ambiguous and may be informed by a different range of approaches.

It is extremely important that researchers select the most appropriate design for their study. In making their choice of the best approach to answer the research question, they must also take account of their own experience, any support or supervision they will need, any cost and other resource implications, the accessibility of the sample and whether there are any complex ethical considerations which may impede the progress of the research.

All of these factors influence the development of the overall research design. What is extremely important to this process is that there is congruence between the nature of the question posed by the researcher and the research design selected. In order to enable you to make decisions about the 'fit' between question and design, this section now provides a brief overview of quantitative and qualitative methods, prior to examining the different research methodologies in more detail.

2. Overview of research design

[In margin cross reference to Chapter 5] The relationship between philosophy and research is very influential in guiding (either consciously or not) a researcher's choice of research methodology.

You will recall from Chapter 5 that the paradigm of positivism is a world view which assumes that rules govern the social world in much the same way as rules and laws govern the natural world. Consequently positivism assumes that social reality exists in the same way as physical reality and that this reality can be captured and measured. In this process, the researcher is detached and 'objective' contributing therefore unbiased and supposedly value-free knowledge. Emphasis within this paradigm is on testing theory and determining cause and effect, resulting in the generation of predictive knowledge. Consequently research within this paradigm uses predominantly quantitative research methods.

In contrast, the naturalistic paradigm assumes that there is no single and objective reality or truth because, as we are all different, a number of realities can simultaneously exist. This paradigm acknowledges therefore that different people will attach different meanings to the same phenomena. Research within this paradigm is concerned with understanding these different perceptions and meanings. The cultural context in which the research takes place, and the position and influence of the researcher are not ignored in the research process but considered important. Emphasis in this paradigm is on generating theory and qualitative methods are predominantly used.

[Margin cross reference to quantitative qualitative debate in previous chapter] Over the last two decades there has been significant debate in the medical and healthcare literature about the relative merits of quantitative and qualitative research methods. Proponents of quantitative methods, for example, have suggested that all research should use such methods, as this is the only way to ensure the validity and reliability of research. Conversely, advocates of qualitative methods have suggested that it is only by using these methods that we can truly understand the experience of a patient or client.

Carson and Fairbairn (2002, p.21) have been critical of researchers who appear entrenched in one paradigm and suggest that:

'One of the problems with some and perhaps many researchers in nursing and allied health areas is that they are so committed to a particular research paradigm, that they fail to notice whether it can deliver adequate answers to their research questions. Indeed, rather than looking for a method that is appropriate to the research questions that are raised, some will change those questions to allow them to make use of their favoured research method or methods'.

In contrast to 'methodolatry' (Oakley 1990), other commentators argue that no one research methodology is fundamentally superior to another (Avis 1994). Arguments about which methods are the best are therefore fruitless (Begley 1996) and indeed, as we shall see later, different methodologies can be used complementarily (Poole and Jones 1996). Closs and Cheater (1999, p.13) suggest that 'it is time to stop wasting energy on arguing whether qualitative or quantitative methods provide the "best" information for nursing. We need to choose whichever method is likely to answer clearly articulated questions of importance to the profession'.

So rather than framing a research question so that it can be answered using a researcher's favoured methodological approach, it is important that nursing and healthcare researchers first frame the question and then choose the most appropriate method to answer this question. In other words they should choose the correct tool to do the job rather than first choosing the tool and then asking 'Now, what job can I do?'

Activity 6.4

Go back to the research questions identified on page 12. See whether you can identify which questions would be most amenable to examination via qualitative or quantitative methods.

2. Quantitative methods

When a research question is attempting to generate explanatory or predictive knowledge then quantitative methods are the methods of choice.

This section examines two types of quantitative research method, the randomised controlled trial and the survey.

3. Randomised controlled trial (RCT)

There are a number of experimental designs but the principal one in healthcare is the randomised controlled trial (RCT). The RCT rigorously and systematically studies cause-and-effect relationships between variables (Parahoo 1997) and results in the production of predictive knowledge. The methodology is characterised by three features - control, randomisation and manipulation - which ensure as far as possible that the results obtained are a direct result of the effects of the intervention (Parahoo 1997). Most commonly, it is the uncertainty of a treatment effect that drives or is a pre-requisite for an RCT (Oakley 1990) and in this circumstance, the RCT is considered the most appropriate research approach to use (Closs and Cheater 1997).

Within an RCT, subjects are drawn from a reference population using careful selection criteria and then randomly allocated to either a control or treatment group. These randomisation procedures are carefully adhered to so that the features of the control and treatment groups are comparable. The intervention is then manipulated, the treatment group receives the intervention whilst the control group does not. In this way, other variables which may have accounted for the difference between the treatment and control groups are controlled. The outcomes between the treatment and non-treatment groups are then measured and compared.

As a result of the RCT's ability to minimise the effect of bias 'the randomised controlled trial is commonly considered the "gold standard" by which other research designs are judged' (Evans and Pearson 2001, p.597). However, although it is the major research methodology in medicine (Oakley 1990, Evans and Pearson 2001) there are only a small number of nursing RCTs (Cullum 1997, Parahoo 1997, Magarey, 2001). One of the reasons for this is that it is difficult in nursing to maintain the degree of control required to undertake a RCT. Frequently nursing practice is a highly complex affair where it is difficult to isolate and control variables. Patients and nursing are not static but dynamic and the emphasis on person-centred and individualised nursing care makes generalisation difficult (Parahoo 1997).

So despite their clear role in generating predictive knowledge, RCTs have been criticised for being positivist and reductionist and for failing to

take into account the real-life and 'messy' world of healthcare practice (Parahoo 1997). One of the limitations of RCTs is their sole reliance on the criterion of effectiveness (Evans and Pearson 2001) and one of the consequences of this is that 'nursing research is now being collected, sorted, appraised and summarised under a narrowly defined concept of what constitutes good evidence' (Evans and Pearson 2001, p.594). Because the whole evidence based-practice movement is defined almost exclusively in terms of the evidence generated via RCTs (French 1999, Evans and Pearson 2001), this results in a disregard of evidence generated in other traditions. So reliance on RCTs as the methodological 'gold standard', may serve to limit nursing's body of knowledge, as not all aspects of nursing practice are open to enquiry in this way. Evans and Pearson (2001, p.595) argue that 'this is not to suggest that randomised controlled trials are not important to nursing, rather that they are not the only source of valid evidence that should inform and guide nursing practice'.

They suggest that in addition to effectiveness there are two other components of evidence: feasibility and appropriateness. Appropriateness is concerned with 'the impact of the intervention from the perspective of the recipient' (Evans 2003, p.81). So inclusion of this criterion into the design of RCTs and therefore systematic literature reviews, will allow for examination of the effect of the treatment on the patient. Feasibility is concerned with the context in which the intervention takes place and examines 'whether the intervention can and should be implemented' (Evans 2003, p.81). So for example, the findings of an RCT conducted in a hospital

setting may not necessarily be relevant to patients in a primary care or intermediate care setting (Closs and Cheater 1999).

Evans (2003) argues therefore that the RCT provides only a partial picture and is unable to provide all the answers 'needed for a complete evaluation' (Evans 2003, p.82). The implication of using a fuller range of criteria for establishing an evidence base for nursing and health care is that all valid and relevant evidence, is brought together, not just that which pertains to effectiveness. Inclusion of appropriateness and feasibility would therefore permit examination of issues such as compliance. There is little point in carefully designing an RCT to examine the effectiveness of a particular intervention if the experimental group is going to encounter problems with compliance. For example, in a review of randomised and quasi-randomised controlled trials (ie a controlled trial that lacks the same degree of control as an RCT) that examined whether the use of hip protectors reduced the incidence of hip fractures among older people following a fall, Parker et al (2002) reported there were significant variations in the rates of compliance across the studies reviewed, ranging from only 24% to 86%. If patients did not comply with wearing the hip protectors, perhaps because they were uncomfortable, this could have significantly affected the findings.

'Traditional quantitative approaches, such as the RCT, are an appropriate means of testing an intervention or treatment, but, and herein is the importance of qualitative approaches, beliefs and understanding must be

explored to establish, for example, reasons why patients do not adhere to medication regimes. Without such insights clinical practice is unlikely to be either cost or clinically effective' (Colyer and Kamath 1999, p.192).

In summary, it is clear that whilst RCTs cannot meet all our needs (Black 1996), they remain important to the generation of nursing knowledge. Poole and Jones (1996, p.108) argue that by 'ignoring the contribution of the experimental design, there is a risk of overlooking certain areas of potential nursing knowledge'. So what is called for is a recognition of complementarity between research methodologies and that what is important is that 'researchers should be united in their quest for scientific rigour in evaluation, regardless of the method used' (Black 1996, p.1215).

Activity 6.5

Go back to the hypothetical research questions on page 12. Identify those you think are amenable to enquiry using a RCT.

You may have concluded that perhaps questions 3, 4 and 5 could be explored using a RCT. For example, the relationship between restricted use of physical restraint practices and the rates of falls in older people in a residential setting could be explored using a carefully designed RCT. Patients could be randomly allocated to either a control group (that receives standard physical restraint practices) or a treatment group (that receives

restricted physical restraint practices). The incidence of falls in both groups could then be measured.

Box 1 Example of an RCT

Robertson et al (2002) conducted an RCT to find out whether a home-based exercise programme for people over the age of 75 years was a cost effective way of reducing the number of falls and injuries related to falls. 240 people over the age of 75 (mean 81 years) took part: 121 were allocated to the exercise programme run by a district nurse, and 119 received usual care. The outcome measures were the number of falls and injuries due to falls, the cost of implementing the programme and the falls-related hospital costs. Participants in the exercise group had significantly fewer falls than those in the no-treatment group and the programme resulted in cost savings.

3. Survey

Surveys are a frequently used methodology in nursing research as they are a relatively cost effective way of gathering information from a large number of people. They enable us to achieve a 'snapshot' of a situation and ask questions such as 'What is going on?' or 'What do people think?'. They are also used widely in other arenas, for example in market research and general population surveys such as the General Household Survey or the Population Census.

Surveys can be described as either descriptive or analytical.

Descriptive surveys attempt to identify descriptive statements about the population under study, whereas analytical or explanatory surveys attempt to suggest relationships or associations between a number of different variables under study (Atkinson 1996).

The most commonly used methods of data collection in survey research are questionnaires and structured interviews. Questionnaire and interview schedule design is therefore important as the quality of these will determine the quality of the data collected. These data are usually quantitative and are analysed using descriptive and inferential statistics. The knowledge generated is therefore predominantly descriptive (for descriptive surveys) and explanatory (for analytical or explanatory surveys).

However, although familiarity, relative cost-effectiveness and the ability to reach a large audience are advantages of surveys, there are a number of limitations to this research approach. As the usual aim of survey research is to make generalisations from the survey sample to the wider population, it is important that the survey sample is indeed typical and therefore representative of that total population. Clear descriptions of the sampling decisions taken are therefore important. Related to the concept of generalisation is the issue of response rates. Frequently, surveys rely on respondents self-completing a questionnaire. So even if the survey sample is representative of the population at large, the utility of the data can be undermined if there is a low response rate. If there is a poor response rate,

for example under 50%, researchers must take care in making generalisations to the wider population, as the survey respondents may be systematically different to non-responders.

Linked to the nature of the sample and response rates, is the issue of validity in survey research. The validity of survey data can be compromised because of the self-report nature of the data collection procedure. Although attempts can be made in the design of the questionnaire to minimise threats to validity, validity is always vulnerable in survey research. We have already described how surveys are a very efficient way of capturing a lot of data from a relatively large sample. However, if the questionnaire has not been designed carefully, the amount of data generated can be overwhelming, making analysis difficult. Consequently it may be possible to paint a picture of *what* is happening without understanding *why*. In this instance, the survey is a missed opportunity as only superficial data may have been collected. A further limitation of survey research is that the questions used in the design of the questionnaire may reflect the researcher's ideas and theoretical insights. Researchers can therefore be criticised for influencing the nature of the responses given.

Activity 6.6

Go back to the hypothetical research questions on page 13. Which of these questions could be answered using survey research?

Perhaps you concluded that only the first two questions are open to investigation using surveys. So for example, a survey could be used to examine older women's experiences of widowhood. Using a carefully constructed questionnaire, informed by the available literature, a representative sample of older women could be surveyed and their responses analysed using descriptive and inferential statistics.

Box 2 Example of survey design

Griffiths (2002) conducted a survey to examine multidisciplinary care and discharge planning processes on a number of wards and on a nurse-led intermediate care in-patient (NLIU) in one NHS Trust in England. The survey was conducted in parallel with an RCT, and so the research design is an example of methodological triangulation (see page 39). Questionnaires were sent to 18 wards that had referred patients to the NLIU within the last 18 months, and also to the NLIU itself. The questionnaire was based on an already validated questionnaire designed to examine multidisciplinary discharge planning practice. 16 questionnaires were returned. The findings show the NLIU appeared similar to the wards in terms of how care was organised and that that overall input from professions other than nursing, was not substantially lower on the NLIU.

2. Qualitative research methods

When a research question is attempting to generate exploratory or descriptive knowledge then qualitative research methods, influenced by the

naturalistic paradigm, are most appropriate. Closs and Cheater (1999, p.15) describe the usefulness of qualitative methods:

'Evidence from qualitative studies provides the essential groundwork from which many clinical problems are identified and understood, and hypotheses are generated and tested. A great strength of qualitative research is its attention to detail and context. Qualitative methods are particularly appropriate when little is known about a topic'.

In this section we will examine three research methodologies that generate qualitative data: ethnography, phenomenology and grounded theory.

3. Ethnography

Essentially ethnography is concerned with describing people in their cultural context. It is both a process - a methodology - and an end product- an ethnography. Ethnography has its roots in social anthropology and traditionally, focussed on small scale communities, in 'other' or 'exotic' cultures. However, contemporary ethnography no longer just focuses on 'other' but also settings 'at home', in what has come to be described as 'anthropology at home' (Jackson 1987, Rapport 2000). The challenge of anthropology at home is to 'make strange the familiar' (Draper 2000). It is therefore a research approach that helps us to literally 'describe culture'.

Anthropology and the tool of ethnography, seek to understand the culture under study, through a process of thick description, which is detailed and concerned with the nitty-gritty ins and outs of everyday life. So ethnography enables the capture of multiple and different voices in their everyday context. The researcher uses known methods of data collection such as semi-structured or open interviews, observation, diaries and historical documents, and then analyses these in the context of the culture under study. During this process of data collection the researcher becomes part of the culture under study, and is therefore exposed to the nuances of every day life in that culture. Ethnography has the potential therefore to be highly reflexive, because the researcher acknowledges how their particular cultural location, who they are and their values and beliefs, shape the conduct of the study and the interpretation of the data.

Box 3 Example of ethnographic research

Holland (1999) explored the transition of student nurses to qualified nurses using an ethnographic approach. She undertook participant observation and interviews in the practice setting, along with an open-ended questionnaire. Her sample was four groups of adult branch student nurses in a college of nursing in England. Using thematic data analysis 8 key themes were identified. Drawing on ritual transition theory, her findings indicated 'an ill-defined transition' for the students which was perpetuated by their dual role as both student and worker.

3. Phenomenology

Based on Husserlian philosophy, phenomenology in contrast to ethnography, is concerned with understanding the individual experience. So a researcher adopting a phenomenological research approach, seeks to understand an individual's (lived) experience of a phenomenon as expressed by the individual. It is an approach 'that emphasises the complexity of human experience and the need to study that experience as it is actually lived' (Polit and Hungler 1991, p.651). The aim is to develop descriptions and insights that provide a clear picture of the phenomenon from the perspective of those involved. Qualitative data collection methods are commonly used, such as open or semi-structured interviews, stories and diaries.

Husserlian phenomenology stresses the notion that only those who experience the particular phenomenon are capable of communicating their experiences to the outside world (Parahoo 1997). The researcher attempts to put aside their own preconceptions about the phenomenon through the process of 'bracketing'. This technique is intended to exclude personal bias from the study in order to ensure that the description of the participant's experience is as impartial and accurate as possible. It involves researchers examining their own assumptions, values and prejudices and attempting to set them on one side, or bracket them, whilst conducting the research. This process of bracketing is in stark contrast to the reflexivity inherent in ethnography.

Box 4 Example of Husserlian phenomenology

King and Turner (2000) undertook a Husserlian phenomenological study to explore the experiences of registered nurses caring for adolescent girls with anorexia, in Victoria, Australia. Five female registered nurses were interviewed in order to explore their experiences of caring for these anorexic girls. The researcher used a number of bracketing strategies as a way of suspending their prior beliefs and these included not doing the literature review until after data collection was complete and 'undertaking an audio-taped exegesis of own understandings prior to commencement of the study' (p.141). Data were analysed and 6 themes emerged: personal core values of nurses; core values challenged; emotional turmoil; frustration; turning points; and resolution. King and Turner describe these themes as accounting for the journey nurses take when caring for adolescent anorexic females and call for preparation and continued support for registered nurses.

A development of Husserlian phenomenology is Heideggarian phenomenology. This approach emphasises the 'experience of understanding' (Parahoo 1997, p.44) rather than just the experience itself. So it is concerned with how people make sense of what is happening to them. Heidegger rejects Husserl's concept of bracketing, as he argues that it is impossible for the researcher not to come to the research setting influenced and informed by their own beliefs and values.

Box 5 Example of Heideggarian phenomenology

Hodges, Keeley and Grier (2001) conducted a study to explore the perceptions of nurses, students and older people about living with chronic illness. 65 participants were involved in 7 focus group interviews, which were transcribed and analysed thematically. A key aspect of the focus group interviews were that participants were shown 5 slides of art master pieces and then questions in the focus group included 'If this painting were the cover of a book about chronic illness, what would be the story?', 'Does the painting remind you of a feeling you might have had related to health?'. Themes that were developed from the data were: social isolation, role changes, and movement and inertia.

3. Grounded Theory

Grounded theory has its roots in symbolic interactionism, which is an 'approach to the interpretation of social action and the formation of identity' (Billington, Hockey and Strawbridge 1998, p.259). It is an inductive approach to generating knowledge, where theories or hypotheses emerge from or are 'grounded' in the data. So grounded theory attempts to develop explanatory theory from the data that have been collected.

A key difference to other qualitative methods is that researchers begin their data collection and from this initial data begin to formulate a theory, which is then subsequently developed and confirmed (or not)

through further data collection. The grounded theory approach attempts therefore to build theory inductively through an iterative process of data collection and analysis. In order to ensure that it is the data leading the development of theory, researchers using grounded theory will not usually examine the relevant literature concerning the topic, prior to the data collection process. Strauss and Corbin (1990 in Parahoo 1997, p.45), who were early pioneers of this approach, describe how 'data collection, analysis, and theory stand in reciprocal relationship with each other, One does not begin with a theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge'.

Box 6 Example of grounded theory

Levy (1999) conducted a grounded theory study to investigate the processes by which midwives facilitate women to make informed choices over the pregnancy and delivery. Interactions between midwives and women were observed and interviews were also conducted with the midwives. Data were analysed using grounded theory approaches to analysis and the main category that emerged was what Levy called 'protective steering', 'whereby midwives were concerned to protect the women in their care, as well as themselves, when choices were made' (Levy 1999, p,104). Other categories that emerged were orienting, protective gate-keeping and raising awareness.

So these three different approaches to the generation of qualitative data, share some similarities and yet are also distinctive. Sometimes

however it is difficult to distinguish between the three approaches, and Parahoo (1997, p.46) summarises it thus:

'Phenomenology collects data on individual's experiences as its' focus is on individuals. In ethnography, individuals are studied as part of their environment, and the focus is on individuals not in isolation, but in relation to their institutions, organisations, communities, customs or policies. Both these approaches seek mainly to describe phenomena rather than to explain them. In grounded theory, the focus is on the generation of theories from data, and it therefore matters little if individuals are studied in isolation or as part of their cultural and social environment'.

However, despite their advantages in producing 'thick description', it is important to identify that qualitative research methods are commonly criticised on a number of counts. Firstly, the influence of the researcher on qualitative methods is considered to be more 'subjective' and therefore a threat to the rigour of the study. Secondly, purposeful rather than random sampling techniques are frequently used, making it impossible to generalise the findings to a wider population. However it is important to remember that these criteria for judging research - objectivity, random sampling/randomisation and generalisation - are drawn from an alternative research paradigm and are therefore inappropriate for qualitative research methods. As we have already seen, qualitative research seeks to do different things to quantitative research so it is inappropriate to use evaluation criteria designed for quantitative studies. What is important is that researchers using

qualitative methods describe their approach to ensuring rigour and credibility.

Activity 6.7

Go back to the research questions identified on page 13. Think carefully about which would be amenable to examination using ethnography, phenomenology or grounded theory. How might you need to modify the research questions in order to 'fit' with these different approaches?

You will have perhaps concluded that only the first two research questions could be answered using these approaches. So, for example, ethnography could be used to explore a group of middle class men's experiences of their transition to contemporary Western fatherhood. Alternatively, phenomenology could be used to explore women's lived experiences of their widowhood.

2. New paradigm research

In the final part of this section, we examine two research approaches associated with the critical theory paradigm, which have been described as 'new paradigm' research (Henderson 1995): action research and participatory research.

3. Action research

Action research has its home in the critical theory paradigm, as its overriding purpose is to achieve change and move practice on. Originally used in education it is now becoming more popular in healthcare settings.

Waterman et al (2001, p.11) define action research as 'a period of enquiry that describes, interprets and explains social situations while executing a change intervention aimed at improvement and involvement. It is problem-focussed, context-specific and future oriented'. This definition is particularly helpful in that it identifies the key distinguishing elements of action research:

- It is frequently undertaken over time
- It attempts to explain why things are happening
- It is concerned with introducing change
- It emphasises involvement
- It is concerned with improvement in practice

In its truest form action research embraces the notion of doing research *with* rather than *on* people. It is participatory and involves 'participants' rather than 'subjects' or 'respondents'. It is therefore more democratic as participants are involved as key stakeholders in 'defining problems, implementing solutions and evaluating them' (Williamson and Prosser 2002, p.587). Furthermore it is located in the 'real life' context of clinical practice.

So in contrast to how the messy real world of nursing can challenge an RCT, this messy world becomes a crucial feature of action research.

In doing research and solving a problem at the same time (Webb 1996), action research involves establishing the research question, identifying the most appropriate research design, implementing the desired change, collecting and analysing data. Its stages mirror those of the nursing process: assessment of the problem, identification of the research question/action, planning the appropriate change and then evaluating this change.

Its strengths therefore are that it can really help to develop practice and, because it directly involves those for whom the change is very relevant, it is more likely to succeed. So, action research places emphasis on the process as well as the outcome. However, its limitations are that because of its context specificity, generalisability to other settings is difficult. Also, just as one of its strengths evolves from the involvement of those around, conversely it *depends* on their involvement.

Furthermore, Williamson and Prosser (2002) suggest that although action research has great potential for changing healthcare practice due to its collaborative nature, it can raise political issues (such as organisational structure and process can be questioned) and ethical challenges (safeguarding anonymity, informed consent, confidentiality and protection from harm) for researchers.

Activity 6.8

Go back to the research questions identified on page 14. Which would most suit an action research approach?

It is possible that the third research question could be explored using action research. Involving the multi-disciplinary team, the impact of the introduction of the in-house training programme could be evaluated by assessing the quality of pain management on the ward, as measured by perhaps changes in pain assessment scores.

3. Participatory research

This is a relatively new and developing research approach in healthcare and shares some of the principles of action research for example, reciprocity, participation and change. It cannot be described as a single method or design as the methods used will vary from project to project (Northway 2000). However the essence of participatory research is that it emphasises working in partnership with users, in order to hear their voices and test out different approaches to delivery (Tetley and Hanson 2000). It is 'carried out by local people rather than on them' (Cornwall and Jewkes 1995) and can involve prolonged contact with collaborators (Aranda and Street 2001). Although familiar research methods might be used (such as interviews and questionnaires) the crucial difference between participatory research and other conventional research methodologies, is the relocation of power in the research process (Cornwall and Jewkes 1995).

Tetley and Hanson (2000, p.69-88) describe how participatory research provides 'new ways of giving people a voice in the research process' and they contrast other more 'traditional' forms of either scientific or social research which espouse knowledge generation, control and power, with the more egalitarian principles of participatory research. So the emphasis is on collaboration, participants setting the research agenda, advising on data collection and analysis procedures and dissemination of results (Henderson 1995). Participatory research therefore involves a complete shift in the power dynamics of the research relationship where control and power is held by the participants and not the researchers.

Northway identifies a number of features of participatory research:

- It relies on active participation throughout all stages of the research project
- It examines power relations within the research
- It is an educational process in which researchers and participants learn together
- It has the capacity to generate different types of knowledge
- It enables action and 'rather than imposing solutions it recognises that people have the capacity to develop and implement their own solutions' (Northway 2000: 45)
- It examines personal and professional values.

So when examining participatory research, or in fact any research which claims to have involved users, we need to explore the extent of this participation, and examine the degree to which the researchers have been true to their word, or whether they have merely paid lip service to the concept of participation.

2. Triangulation

From this brief description of some of the key research designs, it can be seen that lots of different research designs can be used to answer the very many different types of research questions asked within the healthcare community. We have also already noted that rather than perpetuating the qualitative versus quantitative debate, we should acknowledge the relative merits of these different methods, as all of these are needed to build a research base for nursing (Closs and Cheater 1999). As each of these methods has its own strengths and limitations (Black 1996), it is possible to combine different methods, within the one research study, in order to maximise the strengths of each and provide a fuller picture of the phenomenon under study. This is called triangulation and offers an alternative to what can be regarded as the bi-polar qualitative and quantitative debate (Cowman 1993), thereby contributing to a more a balanced approach to generation of research evidence.

Begley (1996) distinguishes between five types of triangulation:

Data triangulation - which is the use of multiple data sources, at different time intervals, at multiple sites, from different people

Investigator triangulation - when more than one experienced researcher examines the data

Theoretical triangulation - when data are exposed to all possible theoretical interpretations

Methodological triangulation - when two or more methods are used in the same study. This can be across-method (from different research traditions) or within-method (from the same research tradition).

Analytical triangulation - when two or more approaches to the analysis of the same data are taken.

An example of across-method methodological triangulation might be the use of a RCT to determine the effectiveness of an intervention and a phenomenological exploration of the impact of this intervention on the client's lived experience. In this instance it may be possible that data generated from one 'arm' of the study may contradict that generated in another, and the researcher's task is then to explore the possible reasons for this.

Triangulation is therefore not just about confirmation of research data but also about ensuring completeness of data (Begley 1996), capturing as much as possible about a particular phenomenon. So triangulation 'must be chosen deliberately, for the correct reasons, and an adequate description

of the rationale, planning and implementation of the method should be given' (Begley 1996, p.127).

1. Conclusion

In this chapter we have explored the nature of the relationship between research question and research design. We first examined what is meant by the research question and how different research questions result in the generation of different types of knowledge. We then explored some of the major research designs involving both quantitative and qualitative research methods, and discussed some of their strengths and weaknesses. Using hypothetical research questions and real examples of research, we have illustrated the ways in which different questions demand different methods. Our aim in doing this is to demonstrate the key issue in this relationship between question and design - that research design should be driven by the research question, not the other way around. When critically appraising research reports it is therefore crucially important that you are able to establish an appropriate fit between the question asked by the researcher and the methodology proposed. So what are the key issues to look for in a published paper that provide clues about the fit between question and design? It might be helpful to bear in mind the following questions when considering this issue. A carefully written research report should include reference to most of these questions:

What is the purpose of the research?

Is its purpose to describe, explain or predict? Are the aims of the research clearly stated?

Is this expressed as a clear research question?

Is the question interrogative or declarative?

Does the proposed research design reflect existing knowledge of the subject?

Does the researcher make reference to what is currently known about the topic? Remember you would not expect to see this in grounded theory.

What is the researcher's previous experience of research?

Is the researcher experienced across a range of methodologies?

Does the framing of the research question enable the use of the researcher's favoured approach?

Is the research question leading?

Are the methods of data collection and analysis appropriate for the design?

For example, direct measurement in RCTs and interviews, observation, historical documents in ethnographic research.

Does the researcher appropriately discuss mechanisms to ensure the rigour and quality of the research?

Is there a discussion of reliability and validity in quantitative methods and credibility, trustworthiness and authenticity in qualitative methods?

Does the sample size reflect the research design?

You would expect a large sample for a RCT for example, and smaller samples for qualitative methods.

Is the role of the researcher in the research process discussed?

You would expect quantitative methods to discuss this in terms of minimising bias and extraneous variables; qualitative methods to discuss this in terms of reflexivity; and action research and participatory research to discuss this in terms of their action/role in the project)

Is the position of those researched made clear?

In quantitative methods, the researched are likely to be known as 'subjects', in qualitative methods as 'respondents' or 'informants', and in participatory research as 'participants'.

What implications for practice are made?

The results of a large RCT may have significant implications for practice, whereas making large claims to change practice on the basis of a small ethnographic study are inappropriate.

Are there any misfits?

For example, this could be a research study which collects qualitative data that are then analysed quantitatively.

Further Reading

Evans D. Hierarchy of evidence: a framework for ranking evidence evaluating healthcare interventions *Journal of Clinical Nursing* 2003; 12: 77-84.

In this very recent paper, Evans draws on some of his earlier work. He argues that the sole criterion of effectiveness, upon which RCTs and the evidence based practice movement are based, is inappropriate because it only provides a partial picture as to the impact of an intervention on a patient or client. In this paper he fleshes out an alternative hierarchy of evidence, which he suggests should include the other criteria of feasibility and appropriateness.

French P. What is the evidence on evidence-based nursing? An epistemological concern *Journal of Advanced Nursing* 2002; 37 (3): 250–257.

In this paper, French examines the meaning of the term ‘evidence-based nursing’ and argues that its meaning is unclear. He suggests that the term is frequently used as a euphemism for other terms such as ‘research-based practice’, ‘professional practice development’, ‘clinical judgement/problem

solving' and 'managed care'. He concludes that there is little evidence that EBP is a stable construct.

McSherry R. Simmons M. Abbott P. (eds) Evidence-informed nursing: a guide for clinical nurses. London: Routledge; 2002.

This is a useful and compact book which explores the key issues that contribute to the development of evidence-based nursing practice.

Parahoo K. Nursing research: principles, process and issues. Basingstoke: Macmillan; 1997.

This is a classic contribution to the nursing research literature and explores in detail the different research designs.

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