The research process is a series of steps that need to be undertaken to carry out any piece of research. The precise stages of the research process, and the order in which they are undertaken, will vary depending on the nature of the research, but will always follow a systematic pattern from initial ideas through to dissemination and implementation.

Rigour in research is essential if the work is to be trustworthy and free from bias.

INTRODUCTION

The process of undertaking research is essentially the same whether the subject matter of the research is pure science, medicine, history or nursing. The following rather expansive definition from Graziano and Raulin (2004) sums up the breadth of scope of the research process:

‘Research is a systematic search for information, a process of inquiry. It can be carried out in libraries, laboratories, schoolrooms, hospitals, factories, in the pages of the Bible, on street corners, or in the wild watching a herd of elephants’ (Graziano & Raulin 2004: 31)

In all cases the researcher must ascertain the extent of existing knowledge, define their own area of enquiry, collect data and analyse it, and draw conclusions. For the pure scientist, however, the research might take place in the context of a laboratory, where experimentation is relatively straightforward as the researcher is in control of the environment and can eliminate potential confounding factors that might invalidate the research. Unless using animals or human tissue, there are few ethical considerations to take into account.

For the student of nursing research, or any research in a social context, the process is complicated by practical and ethical constraints of working in the ‘real world’ (Robson 2002). There is no single, universally accepted way of carrying out research in the social world, but a plethora of different designs and methodologies ranging from phenomenology to randomised controlled trials, from epidemiology to action research. The range of approaches derives from different paradigms, or ways of seeing the world. However, all are valid ways of conducting research, provided the methodology used is...
appropriate for the research question and is applied in a rigorous, systematic fashion.

In this chapter the research process that is common to all nursing research will be explored, and subsequent chapters in Section 2 will look at each of the stages of research in more detail. Different methodologies or research designs are discussed in turn, and in detail, in Section 3.

Although the research process will be presented as a linear, sequential process, the stages are often revisited several times during the process. In qualitative research, in particular, it is likely that the ‘stages’ of the research process will be modified to take account of the emergent nature of the enterprise. Qualitative researchers sometimes find it difficult or even inappropriate to formulate a precise research question until they have begun to collect, and possibly even analyse, data.

However, it is helpful in the first instance to think through the entire research process in a systematic way. Many authors (Hek et al. 2006, Parahoo 2006, Moule & Goodman 2009) have described the research process, and each comes up with a different number of stages, but essentially they contain the same elements. Table 2.1 illustrates the process as it will be described in this chapter, and indicates the principal chapters in the book that deal with each stage. This chapter gives a brief overview of the various stages to enable readers to see the whole before looking at each stage in more detail.

### Developing the Research Question

Most research questions begin with a ‘hunch’ or initial idea that is not precisely defined. The idea might arise from clinical practice, from professional discussion among colleagues, from an issue in the media, or from reading an article or book. Alternatively the question may be derived from a ‘call for proposals’ from a funding body that asks researchers to develop a proposal on a specific topic. Box 2.1 provides an example of such a call, in this case from the National Institute for Health Research Service Delivery and Organisation (SDO) Programme. The call is specifically about the research areas to be investigated, indicates the methods to be used, the funding available and timescale required. Full details are available from the SDO website, together with a standard application form and a deadline by which proposals have to be submitted.

But most nurse researchers begin with an initial idea that is not yet well defined. Let us consider how research questions might be developed, using some real examples from the nursing literature to illustrate our discussion (see Research Examples 2.1, 2.2 and 2.3).

**Question 1**

Perhaps a research team has a ‘hunch’ that the use of pelvic floor exercises might help women in the

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second stage of labour. This hunch is probably based on knowledge of the anatomy of the pelvic muscles and the process of delivery. It might also be supported by personal or professional experience of midwives. There are several ways in which the question could be developed. The following are examples of research questions derived from this area of interest.
2.1 A Quantitative Experimental Study


This study used a quantitative experimental approach to assess the effectiveness of using a structured training programme of pelvic floor exercises in reducing time spent in the second stage of labour during childbirth. Researchers in Norway recruited 301 first-time mothers during pregnancy, and randomly allocated them to either a training group (who were given an exercise programme delivered by a physiotherapist) or a control group (who had normal care). Time spent in the second stage of labour was measured for the two groups. Results showed that women in the training group had a lower rate of prolonged second stage labour than women in the control group (25% compared to 33%).

2.2 A Quantitative Questionnaire Survey


A national survey of Canadian paediatricians was conducted to assess their practice in prescribing prophylactic antibiotics for children with urinary tract infections, with and without vesicoureteral reflux. A self-completion questionnaire was mailed to a sample of 1136 paediatricians and 42 paediatric nephrologists. A response rate of 58.1% was obtained. Although a majority of respondents prescribed prophylaxis for children with reflux, only 15% felt that this practice was evidence based. A quarter of respondents also prescribed prophylaxis for children under one year with a first febrile urinary tract infection without evidence of reflux. Again, only 19% felt that this practice was evidence based. The overall conclusion was that practice in this area varies widely in Canada because of a lack of solid evidence about prophylaxis.

2.3 A Qualitative Study


This descriptive qualitative study explored the views and experiences of link nurses for palliative care working in nursing homes in Northern Ireland. A purposive sample of 14 link nurses from 10 nursing homes was selected and interviewed using focus groups. Data from the focus groups were recorded, transcribed and analysed. Link nurses identified a number of barriers to their role as educators and facilitators of palliative care, including lack of management support, a transient workforce and lack of adequate preparation for the role. Facilitators included external support, peer support and access to a resource file. The researchers concluded that the link nurse role had considerable potential to improve care in this area, but managers needed to be aware of the sustained support needed for the role, and more work needs to be done to find ways of developing the role further.
Q1(a) Are pelvic floor exercises taught to women during antenatal classes?
Q1(b) Do pregnant women understand what pelvic floor exercises are, and are they willing to learn the skills of doing them?
Q1(c) Does the use of pelvic floor exercises reduce the length of labour?

Obviously, each of these research questions will give us very different kinds of information and will require different research methods to be employed. They would also need to be refined further – the precise pelvic floor exercises to be taught needs to be clarified, for example, and the stage of pregnancy at which they are taught needs to be defined. Q1(b) suggests the need to measure understanding and willingness to learn – neither of these concepts is straightforward and tools to measure them would need to be developed. Perhaps a qualitative study needs to be undertaken to explore the concepts first.

Research Example 2.1 (Salveson & Morkved 2004) describes an experimental study related to Q1(c). In this case the outcome measure was defined as time taken in second stage of labour, and only first-time mothers were recruited to the study.

Question 2

Alternatively, a research team might be interested in the evidence base used by doctors in their prescribing practice. Overuse of antibiotics in children, for instance, is known to cause problems with the development of drug resistance, and it is important that clinical practice is based on sound clinical evidence. Again, a number of research questions could be asked.

Q2(a) How reliable is the research evidence about prophylactic antibiotic prescription in children with urinary disease?
Q2(b) How effective are prophylactic antibiotics in preventing urinary tract infections in children at risk?
Q2(c) What is the prescribing practice of paediatric doctors regarding antibiotic prophylaxis?

Again, these three questions lead to very different types of study, and again, each question needs further clarification and refinement. What is meant by ‘urinary disease’? How do we decide that research evidence is reliable? What age children are concerned? Which children are ‘at risk’? Research Example 2.2 (Chevalier et al. 2008) is an example of a survey to answer Q2(c), but it was undertaken with a specific group of paediatric doctors in Canada. Is it appropriate to apply the answers gained from this study to doctors in Europe or China?

Question 3

In our last example, research questions might be generated concerning the best way to deliver palliative care in nursing homes. This setting is known to be a common one in which palliative care is delivered, but formal training and facilities are not always available. Three questions could be constructed to investigate this.

Q3(a) Is patient satisfaction with palliative care delivered in nursing homes lower or higher than that delivered in a hospital setting?
Q3(b) What is the level of knowledge about palliative care among nurses working in nursing homes?
Q3(c) What is the experience of link nurses for palliative care working in nursing homes?

Before setting out with any of these questions the researcher would need to be clear how ‘nursing home’ was to be defined, and for Q3(b) a validated tool to measure knowledge would need to be available. Q3(a) suggests a comparative survey of samples of nursing homes and hospitals, but would the underlying question be answered by asking patients’ views alone? Palliative care is needed up to and after the point of death, and so it might be necessary to extend the survey to satisfaction of next of kin, who can give a full picture of care given. Q3(c) suggests a research design that needs a more in-depth approach, and the answer will be contained in words rather than numbers – Research Example 2.3 (Hasson et al. 2008) describes a study to answer this question using a qualitative approach.
USING A HYPOTHESIS

A hypothesis is a statement that can be tested, and is used mostly in experimental research. Qualitative designs and surveys do not usually have a hypothesis, although sometimes surveys do test for differences between groups and so might use one. Statistics are required to test the hypothesis, which has to be very precisely written. The hypothesis expresses the predicted outcome of the experiment, either in positive or negative terms. As an example, Q2(b) above could be answered by testing a hypothesis, which would be something like the following.

*Children under five years of age with reflux given prophylactic antibiotics will experience fewer episodes of urinary tract infection in one year than children with reflux not given prophylactic antibiotics.*

The hypothesis might even express the magnitude of the expected difference – in this case, it might be predicted that children given antibiotics will experience, on average, at least 50% fewer infections than those not given antibiotics. But for the purpose of statistical testing, the hypothesis is more often expressed in negative terms, or as a null hypothesis, such as the following example.

*Children under five years of age with reflux given prophylactic antibiotics will experience the same number of urinary tract infections in one year as those not given prophylactic antibiotics.*

In this case, the experiment would aim to find the null hypothesis false, assuming that prophylactic antibiotics are effective in such cases. Chapter 36 gives more information about how such hypotheses are tested for statistical significance.

SEARCHING AND EVALUATING THE LITERATURE

The next stage is to find out what evidence already exists in the chosen research area. It is a waste of time and money to conduct research where the answer to the question is already known. What is already known about a subject can be found from a variety of sources. Books may be a starting point, but quickly become out of date if the subject matter is topical. Academic journals are a better place to start, and access to online databases such as CINAHL (Cumulative Index of Nursing and Allied Health Literature; see Chapter 6 for more details) make this task speedy and relatively simple. If anything, the problem is that there will be too much information, and Chapter 6 discusses how to refine the search. Beyond written sources, evidence may be found on the internet and various online resources. As well as locating the evidence, it must be appraised and evaluated. Not all that is written is of good quality, and evidence from one country or in one population may not necessarily generalise to other cultures or situations. Chapters 6 and 7 of this book discuss this stage in considerable detail.

Sometimes the research process may consist entirely of a review of the literature. A well-designed systematic review is an accepted research approach in its own right, systematically searching out and evaluating all the research that has been published on a particular topic. In an increasingly complex and fragmented world of information it is important to develop an evidence base that is well validated, and on which practice can be based. Q2(a) above would suggest the need for a systematic literature review, and Chapter 24 deals with this specialised form of research. Research Example 2.4 gives an example of a systematic review.

Most of the questions in the examples above would require a literature review before being able to refine the question further. It might be, for example, that a study has already been conducted testing the effectiveness of pelvic floor exercises in first-time mothers, and found them to be ineffective in reducing time taken in second stage. But can this be applied to women having their second or subsequent child? And can a study conducted in, say, the USA be applied in the UK? A literature search on palliative care in nursing homes might show that nurses in this setting have very low levels of knowledge or interest in palliative care. But the studies are few, out of date and somewhat contradictory. Is it justifiable to conduct a further piece of research in the area?
The Research Process

CHOICE OF METHODOLOGY, RESEARCH DESIGN

The majority of this book (Section 3) is devoted to a description of different research designs. In many ways, the choice of research design is the most important stage of the research process, for it affects all the others. Some questions are more appropriate for an experimental approach; others are entirely suited to an in-depth ethnographic study. Researchers often make explicit a conceptual framework within which they are working, which will determine the overall research approach. A conceptual framework makes clear the researcher’s ‘world view’ – their assumptions and preconceptions about the subject under consideration. In Question 1 above, for example, the researchers may have a conceptual framework that emphasises women’s right to autonomy in decisions and policies relating to labour. Consequently any research study would be concerned with gathering the experiences and feelings of women about their labour, rather than purely objective clinical data. The kind of data collected, the types of analysis that are possible and the way in which the results can be applied to practice will all depend on the research design.

Some research designs are quantitative. This means they ultimately collect numerical data and are amenable to statistical analysis. Such research designs may or may not have a hypothesis, but experimental studies always require such a statement to be tested statistically. Research Example 2.1 (Salvesen & Morkved 2004) and Research Example 2.2 (Chevalier et al. 2008) both describe quantitative studies. Quantitative designs may be experimental, such as Salvesen and Morkved’s design, but may also be observational, such as Chevalier et al.’s survey using a questionnaire. In the latter, structured answers such as ticked boxes enable the data to be coded and translated into numerical form. Surveys may also use medical records or laboratory tests as their data source to estimate the numbers of patients in a community who have measles, for example. Epidemiological studies of the incidence and distribution of diseases also use quantitative methods.

Other research designs are qualitative. These designs use narrative, words, documents or graphical material as their data source, and analyse material to identify themes, relationships, concepts and, in some cases, to develop theory. Such research approaches explore an experience, culture or situation in depth, taking account of context and complexity. Qualitative designs may be used where comparatively little is known about a subject, so no hypothesis can be formulated. The purpose is exploratory rather than explanatory, although qualitative studies may certainly contribute much to our understanding of phenomena and many also develop theory. An example of a qualitative study is given in Research Example 2.3 (Hasson et al. 2008).

Both approaches are valid ways of advancing nursing knowledge. A quantitative study may be very

2.4 Systematic Review


This research study used established methods of systematic review to assess instruments that have been developed to measure nurses’ attitudes towards research utilisation. Four electronic databases were searched for relevant articles published during the period 1982 to 2007, and 186 sources were identified. Of these, 25 met the criteria for review, but only 14 were developed with sound psychometric properties. Only one, that by Estabrooks, was found to have been rigorously tested. This instrument was recommended for use, but further work was suggested to develop this area of research.
good at finding out the extent of compliance with diabetic therapy, for instance, by measuring levels of the blood glucose in a sample of diabetic patients. A qualitative study, on the other hand, may tell us why it is that certain diabetic patients do not take their insulin as prescribed, by observing and talking to them, and gaining understanding of the context in which the insulin is (or is not) taken.

More than this, qualitative and quantitative methodologies are based on different philosophical assumptions and derive from different historical traditions. Chapter 11 discusses these issues in much more detail, and the reader is encouraged to get to grips with this academic debate. Nursing needs to embrace all research methodologies in order to engage with the breadth of questions that need to be asked. Ours is a discipline drawing on many different traditions of academic enquiry.

The research design (or methodology) is distinct from the methods used for data collection. A single data collection method, for example interview or observation, may be used for many different research designs. So we can return to our hypothetical questions generated in questions 1–3 above, and consider the research methodology that might be appropriate to answer each one. In the example relating to pelvic floor exercises for pregnant women, Q1(a) and Q1(b) are both essentially asking for information that can be gathered in a quantitative survey, but Q1(a) might also be answered by observation of antenatal classes, or examination of the women’s records. Q1(c) will require an experimental design to compare outcomes in two groups (Research Example 2.1). With regard to a potential study examining the prescribing of prophylactic antibiotics, Q2(a) suggests a literature review as described above, but Q2(b) would require a rigorous experimental design to answer the question about effectiveness. Q2(c) requires a survey, as described in Research Example 2.2. Finally, in relation to examining the best way to deliver palliative care in nursing homes, Q3(a) and Q3(b) both suggest a quantitative survey design, but Q3(a) will require a comparative survey, measuring satisfaction in the two types of setting. Indeed, this question might require mixed methods, as discussed in Chapter 27. Q3(c) certainly needs a qualitative approach (Research Example 2.3).

**PREPARING A RESEARCH PROPOSAL**

Whether a large-scale, multi-centre study costing many thousands of pounds or a small, unfunded study for an educational degree is planned, a formal research proposal is likely to be needed.

Such a proposal is a written statement of what the researcher intends to do, why, how, when and, often, how much it will cost. It is used to gain approval for the research, secure funding if it is required, and then to guide the research process during its execution. It will often be modified in the light of pilot studies or practical difficulties, but it is important that the detailed intentions are clear at the outset. It has been said that if you don’t know where you are going you are unlikely to get there!

Chapter 8 sets out the content of a research proposal in detail, but the precise form of the proposal will vary according to the nature of the research and the purpose of the written proposal. A proposal written in response to a funding call from the National Institute of Health Research or the Medical Research Council is likely to be a substantial document of many pages, written by a team of experienced researchers. One written for the purpose of outlining a small study for a master’s degree may be only a few pages, written by the postgraduate student themself with some guidance from their supervisor.

Whatever the context, however, the proposal will certainly include a section on each of the stages of the research process outlined in Table 2.1. It will also include a section detailing the ethical issues raised by the research, and how the researcher will ensure that confidentiality, informed consent and other ethical principles are respected. Chapter 3 discusses these issues in more detail. It is usual to include a table or Gantt chart showing the timescale of the project. Table 2.2 shows such a chart for a complex evaluation study involving a survey, documentary analysis, case studies and focus groups. It is also helpful to
The Research Process

identify milestones, stating the date by which each stage of the research will be completed, though this is obviously subject to change as the inevitable obstacles and delays come into play. It is customary to include a breakdown of resources required and a justification of why they are needed.

Clearly, the research proposal cannot be written until the researcher has thought through all the stages of the research process in some detail. However, the proposal is of necessity one of the early stages in the process, as it is impossible to proceed without one.

GAINING ACCESS TO THE DATA

Because of the sensitivity of much of the research that takes place in healthcare, and the vulnerability of many of its subjects, a complex system of governance has been developed in the UK to ensure all research is approved for its ethical soundness, scientific quality and legal propriety. NHS trusts are also concerned to ensure that all research that takes place within the trust is properly funded and insured against liability. A system of ethical regulation via the National Research Ethics Service (www.nres.npsa.nhs.uk/) is
in place, and all applicants carrying out research in healthcare must follow this system. In addition, since 2001 a system of research governance has been developed to guard against research that has not been properly scrutinised and approved, after various high-profile scandals concerning NHS research (Department of Health 2005).

Chapter 10 deals with this topic in depth. Suffice to say at this stage that the system is necessary, but rather bureaucratic and time-consuming. Depending on arrangements at each local trust, it is likely to take anything from 4 to 20 weeks from completing a research proposal to having all the required permissions in place to begin data collection (Gerrish & Guillaume 2006).

In addition to formal permission, however, access to the data may require negotiation of a more informal nature with local personnel who act as ‘gatekeepers’. If access to patients or their records is needed, for example, it may be necessary to gain the co-operation of the appropriate consultant, practice manager or audit department in addition to ethical and research governance committees. Access to a nursing home or school will require the permission of the appropriate senior manager. Chapter 10 also deals in more depth with this informal process of negotiating access.

**SAMPLING**

Once the research begins, the first stage is likely to be selecting the sample. Unless it is a complete census, researchers collect data from a selected group, rather than an entire population. In our earlier examples, samples might be taken from antenatal class attenders, nursing homes in a particular region of the country, consultants in paediatric medicine or relatives of patients requiring palliative care. How are the samples to be selected, and how many is enough? These questions are dealt with in detail in Chapter 12, but the answers are rarely simple, particularly about sample size.

A quantitative study involving a comparison between two groups is likely to require a *power calculation*, a statistical technique to estimate minimum sample size. This is comforting to the researcher as it gives a scientific answer to the question, but is also based on various assumptions and decisions that any statistician making the calculation will ask the researcher to make. In qualitative research samples tend to be smaller, but again there is no hard and fast rule as to how big they must be. Data saturation, or achieving the stage where no new information is being revealed by additional data collection, may be the stated goal, but it is impossible to predict beforehand when that stage may be reached.

As to the method of selection of the sample, there is a range of well-developed methods to choose from (see Chapter 12). The type of sampling will depend on the research design. Random sampling, and its variants, is the method of choice in traditional survey research, whereas theoretical sampling may be more appropriate for grounded theory. Whatever approach is adopted, it is essential for the validity of the research that the sample is chosen in a rigorous way, and sampling techniques adopted are adhered to closely.

The size and selection of the sample will have an effect on the timescale and cost of the research. Usually, the cost increases with sample size, although this is less significant for, say, a postal survey than for a randomised controlled trial. Similarly, in-depth interviewing and subsequent transcription of tape recordings is resource-intensive, and each increase in sample size will require significant extra resources. A realistic assessment of how quickly a particular sample size can be obtained is necessary before embarking on a piece of research – all too often patients with the relevant condition seem to disappear as soon as a research study starts recruiting.

**PILOT STUDY**

It is always advisable to conduct a pilot study before embarking on the research. This may take the form of a ‘dummy run’ to see if the whole recruitment process works, or may simply involve testing out a data collection instrument. Questionnaires are usually piloted on a small sample of people with similar characteristics to those in the full study, to pick up questions that are misinterpreted or items that are frequently missed out. Modifications can then be
made to the questionnaire before large numbers are printed and money wasted. If interviews are to be used, a wise researcher will conduct one or two pilot interviews to test out the interview schedule, ensure technical equipment (such as a tape recorder) works satisfactorily and assess how long the interview is likely to take. Data collected in a pilot study is not usually included with the main results, but may be reported separately and even published if the pilot study is a substantial one.

**DATA COLLECTION**

A wide range of data collection techniques and methods is available, and Chapters 28 to 33 describe the commonest of these. Nursing research relies heavily on interviews, focus groups and questionnaires as methods of choice, but observation, clinical measurement and the use of documents as data are also appropriate methods to be considered. In our earlier Research Examples data collection methods would include clinical observations and documents (length of second stage of labour), questionnaires (prescribing practice of doctors) and focus groups (experience of palliative care link nurses). The stage of data collection is, in many ways, the most straightforward and rewarding stage of research. It frequently involves interaction with patients, the public or other research participants after a long stage of filling in forms and writing research proposals. At last, the researcher gets to ask the questions they started out with.

Data collection tools will usually have been selected at the research proposal stage. Ethical and research governance committees like to see the intended instruments, or at least to have a draft of an interview schedule or questionnaire. The instruments will need to be refined and developed ready for use, however, and practicalities of how the data will be collected, by whom and when are often done as data collection begins.

It is at this stage that the researcher needs to keep tight control over the data collection process. Failure to keep index numbers on documents, or to record the time of a clinical observation, can render data collected useless. It is also important to consider who should be involved in data collection. Using our earlier example, in Question 1 it might be unwise to use the physiotherapist who taught the pelvic floor exercises to collect the data, as they might feel some conscious or unconscious interest in showing that their teaching was effective.

All data collected needs secure storage, whether this is in hard copy (paper records or audiovisual material) or electronic form. Paper copies and tapes need to be locked in a cabinet or drawer to preserve confidentiality, and electronic records need to be stored on a secure computer and backed up on a separate disk or server. Many researchers will preserve both paper and electronic records, as either can be destroyed or corrupted by unexpected events such as fire, theft or computer breakdown.

**DATA ANALYSIS**

This is perhaps the most crucial phase of any research project. Once data are collected, they need to be assembled and organised in such a way that conclusions can be drawn from them. A huge spreadsheet of numbers or multiple pages of narrative cannot be disseminated to others or used in practice until some analysis has taken place. It is also the phase that is most demanding from an intellectual point of view. Whether using qualitative or quantitative methods, data analysis is hard work. Contrary to many people’s expectations, computer software analysis packages such as NVivo (for qualitative analysis) and SPSS (for quantitative analysis) do not do the analysis, they simply provide practical tools to manage the data more easily. The researcher still has to manage and guide the process, and do some serious thinking about the meaning of the data.

If the data collected are qualitative, data analysis techniques such as those described in Chapter 34 can be used. The exact methods used will vary according to the qualitative methodology adopted. In practice, there are few universally accepted methods of analysing qualitative data, but the researcher must make the process ‘transparent’ by describing in detail how the results were derived.

Quantitative data are usually analysed statistically, and Chapters 35 and 36 provide guidance on the
standard techniques available. With anything other than a small project, a quantitative piece of research should include a statistician in the research team, or at least be able to access professional statistical advice.

Some research projects use ‘mixed methods’ that include both qualitative and quantitative approaches. Here, the analysis may attempt to combine the two sets of results, perhaps using the qualitative data to provide interpretation of the quantitative results. See Chapter 27 for more on this issue.

**DISSEMINATION OF THE RESULTS**

Of course there is little point in conducting any research if the results are never made known to anybody except the researcher. Dissemination can take many forms. At the local level, research can be presented to colleagues at team or unit meetings, or as a more formal seminar to local professionals who may be interested. The study in Research Example 2.1 about pelvic floor exercises might be of interest to pregnant mothers, consultant obstetricians, general practitioners and physiotherapists, as well as to midwives themselves. Many nurses have access to a specialist group of health professionals in their discipline at local or national level, and this is also a suitable forum in which to disseminate the results of small- or large-scale research.

The increasing use of the internet has provided opportunities for researchers to post details of their research on a website, perhaps hosted by an NHS trust or university. This ensures that research results are widely and freely available, but, like most online resources, provides no guarantee of quality. Increasingly, however, information is being disseminated via the web, and online discussion groups are also enabling informal exchange of ideas.

Publication in written form, in academic and professional journals, remains the most widely accepted method of dissemination of research, but presentation of results at conferences, by oral presentation or by poster, is also common. All of these media enable fellow researchers and practitioners to discuss the results and provide some feedback about the usefulness of the research, and possible avenues for further studies. Chapter 37 discusses methods of dissemination more thoroughly.

**IMPLEMENTATION OF THE RESULTS**

This topic is dealt with in depth in Chapters 38 and 39. Needless to say, the purpose of nursing research is to improve practice in some way, whether by direct application of the results of a trial, by better informing practitioners of the culture in which they are working, or by evaluating the effects of an innovation. While it is not the direct responsibility of the research community to ensure implementation of the findings of research, it is incumbent on researchers to ensure that their findings are being shared with those who implement nursing policy and engage in clinical practice. This implies that research findings should be published in places where practitioners, managers and policy makers will read them, and taken to professional as well as academic conferences. The findings from the study in Research Example 2.3, for example, will not be implemented unless they reach the managers and owners of nursing homes, who may not attend the research conferences or read the academic journals where the results are first presented.

**ENSURING RIGOUR**

Rigour refers to the strength of the research design in terms of ensuring that all procedures have been followed scrupulously, that all possible confounding factors have been eliminated and that the user can be confident that the conclusions are dependable. Of course, this is always a relative concept; social research can very rarely be said to have eliminated all possible sources of error, but the quality of the research will be judged by the extent to which this has been done.

There are two key concepts that concern the quality of research: validity and reliability. **Validity** concerns the extent to which the research measures what it purports to measure without bias or distortion. A
study to assess the health effects of air pollution in a community would not be valid if it simply collected people’s views about the air quality, without measuring actual levels of disease or even mortality rates. In the study in Research Example 2.1, validity would be reduced if the pelvic floor exercises were taught poorly or if some women were given additional written materials while others were not. Validity would also be affected by the representativeness of the sample chosen – if this included only well-educated, middle-class women from the UK, for example, it would not be valid to apply the results to a mixed community living in Brazil.

Reliability refers to the consistency of measurement within a study. A set of weighing scales that gave a person’s weight as 52kg at 10am and 55kg at 10.05am could not be said to be reliable. Repeated measurement is the usual test of reliability, and can be done by second administration of a questionnaire under similar conditions, or by two researchers making the same set of observations and comparing results. Data collection tools such as quality-of-life scales are extensively tested for reliability before being used as a standard measure in research studies. Unreliable measurement tools will always mean that the validity of a research study is compromised, as confidence in the quality of data collection is reduced. A study might use perfectly reliable instruments, however, and still not be valid. Meticulous collection of body mass index of patients in primary care, for example, will not generate a valid measure of the prevalence of diabetes in the practice, though the two may be related. In the study in Research Example 2.2, a poorly designed questionnaire which gave ambiguous answers or low completion rates would have made the results unreliable.

Some qualitative researchers reject the terms validity and reliability because of their association with the quantitative research tradition, and the assumption implicit in their definition that research can be entirely objective and free from bias (Holloway & Wheeler 2002). Such researchers may prefer to use concepts such as credibility, trustworthiness and transparency to describe the quality of the research, but the underlying concept of rigour and the use of a systematic approach remains the same. Chapters 11, 13, 14 and 15 will discuss these issues further.

CONCLUSIONS

The research process outlined in this chapter will be adapted according to the research design, the scale of the undertaking, resources available and the context in which the research is conducted. However, all research needs to be systematic and rigorous in its approach. This chapter began by discussing the relative complexity of conducting research in a social, rather than laboratory, context. Robson (2002) sums up the situation with characteristic frankness.

‘One of the challenges inherent in carrying out investigations in the “real world” lies in seeking to say something sensible about a complex, relatively poorly controlled and generally “messy” situation’ (Robson 2002: 4)

One of the particular complexities is the need to conduct research that involves people according to ethical principles, and this requirement frequently impinges on the design and conduct of the research process. This question is addressed in the next chapter.

References


Websites

[www.dh.gov.uk/en/Researchanddevelopment/index.htm](http://www.dh.gov.uk/en/Researchanddevelopment/index.htm) – Department of Health section on research and development, where you can find information about research funding, ethical approval and research governance.


[www.rdinfo.org.uk](http://www.rdinfo.org.uk) – R&D info ‘Support and Help’ section gives information about the research process, writing research proposals and getting approval.