Part I

I Understanding research

CHAPTER 1

1 Introduction to midwifery research

Introducing research

The focus of this chapter is to introduce midwifery research, types of knowledge, audit and research, the differences between qualitative and quantitative research and the importance of evidence-based practice. This chapter will assist midwives and students to gain basic knowledge and understanding of what research is and why it is important. This new knowledge will enable midwives and students to understand and appreciate the need for evidence-based practice when caring for childbearing women, their babies and their families. The importance of evidence-based practice will be stressed to promote good standards of care.

Aim

To introduce midwives and students to different research approaches that will help them develop an understanding of types of knowledge, the differences between audit and research and the importance of evidence-based practice.

Learning outcomes

By the end of this introductory chapter, midwives and students:

- will be able to recognise different types of knowledge;
- will be able to distinguish between qualitative and quantitative approaches;
- will know the difference between audit and research;
- will understand the importance of evidence-based practice.

Research questions – what, where, when, why, who and how?

When undertaking research, you firstly have to ask yourself the questions what, where, when, why, who and how? This will help you decide the research approach you need to apply, either quantitative (measures/numbers/counts/frequencies) or qualitative (understanding of words/phrases/language). It

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will also help you to develop a research question or hypothesis (theory) that needs asking and is relevant to something you are curious or concerned about in midwifery education, policy, management or practice. The first task, when you have an idea of the research question you would like to ask, is to find out about any existing evidence there is available on the subject matter.

Ideally, you should choose something you are passionate about or some burning issue you would like to address. Once you have made a decision about what you would like to investigate or explore and have a preliminary research question, you will need to undertake a literature search to see if the research question has already been asked or not. Using a search strategy and structuring the review in some way (which is covered in the next chapter) can be helpful in organising the evidence or identifying a lack of evidence you may find. The search strategy and literature review can be influenced by the research approach adopted and this chapter introduces the different approaches to research.

Midwifery and research

Midwifery-led research has not had a long history, in fact as late as the 1980s there was a paucity of research in this area. Some early midwifery research studies, such as the routine shaving of women in labour (Romney, 1980), the routine use of enemas during labour (Romney & Gordon, 1981), the use of episiotomies (Sleep *et al*., 1984) and the routine admission of women in labour (Garforth & Garcia, 1987), are examples of traditional midwifery practices that were found to be of little benefit to women. The publication of *Effective Care in Pregnancy and Childbirth*, which provided details of several systematic reviews, initially assisted in the dissemination of research evidence to the midwifery profession (Chalmers *et al*., 1989).

The Midwifery Research Database (MIRIAD) had 393 studies recorded in 1995, whereas at its inception period, 1976–1980, only 21 studies were recorded (McCormick & Renfrew, 1997). Presently it is difficult to determine exactly how many midwifery studies are in the public domain, but an internet search using the term 'UK midwifery research studies' on Google Scholar resulted in 38 800 hits (not all necessarily research studies); this does suggest that the body of knowledge has increased significantly. More midwives are now in possession of PhDs, both in the academic and clinical environments, and this means that they have conducted a significant and valid research study.

It was not until the 1980s that the concept of research was included in the midwifery curriculum (Macdonald, 2004). Since then it has become an integral element to student midwives' studies with assignments being based on research critiques or the formulation of research proposals. Post-registration students who are studying at Master's level in most universities have to conduct and write up their research study as part of their dissertation.

Students can add to the body of knowledge of midwifery by conducting a research study. An understanding of the research process is therefore essential from an academic viewpoint. However, it is not the academic viewpoint, but

Box 1.1 The Code: Standards of conduct, performance and ethics for nurses and midwives (NMC, 2008, p. 4).

- Provide a high standard of practice and care at all times.
- Use the best available evidence.
- You must deliver care based on the best available evidence or best practice.
- You must ensure any advice you give is evidence based if you are suggesting healthcare products or service.

evidence-based clinical practice that drives this educational research awareness. In the UK the Nursing and Midwifery Council (NMC) Code (2008), states that practice and care should be underpinned by the best available evidence (Box 1.1).

Types of research knowledge

As mentioned previously a process needs to be followed and this starts with trying to determine 'what you want to know'. This sounds easy, but the reality is that this starting point does take time. It is your thinking time, time to put your thoughts into reality. What burning issues do you want to address? What subject or topic are you passionate about? What have you observed in practice that merits further research? At the beginning of each research module, these are the questions we put to the students and the response we usually receive from them is 'it's not as easy as you think'. Rees (2003) refers to this as the 'conceptual phase', where the potential researcher, or in this case the student, embarking on a research proposal is trying to determine 'what they want to know' and to refine that further into 'how do I find out what I want to know'; and so the research process begins.

The next step is trying to work out how you are going to go about obtaining that information. You might want to find out about people's feelings, experiences of events or circumstances, such as *Women's experiences of obstetric emergencies* (Mapp & Hudson, 2005); or how an intervention/treatment can improve care, e.g. *Ice packs and cooling gel pads* versus *no localised treatment for relief of perineal pain: a randomised controlled trial* (Steen & Marchant, 2007). Or you might have a general idea but want the focus/theory of the study to be generated by the information you collect (Furber & Thomson, 2006).

The type of knowledge that you want to obtain then determines the type of research approach that you will follow which is also referred to as a research paradigm (or the 'philosophical underpinnings'!). This essentially refers to the school of thought or beliefs which forms the basis of your research and determines the type of knowledge you want to acquire (Parahoo, 2006). The following terms are associated with this step in the process – **paradigms** and **qualitative** and **quantitative approaches** (Mackenzie & Knipe, 2006). These

terms and their definitions can be intertwined and can therefore be confusing to understand, however the following should address any confusion.

Key research paradigms are positivism, post-positivism, interpretivism, naturalism, constructivism, critical and postmodern (Grix, 2004; Blaxter *et al*., 2006; Mackenzie & Knipe, 2006). The paradigms which appear to be used mostly in midwifery research are the positivist and naturalistic paradigms. They appear to be the two paradigms which hold the most opposing views. The **positivist paradigm** is considered to be the traditional paradigm underlying the scientific approach. This paradigm assumes that there is a fixed, orderly reality that can be objectively studied and is associated with quantitative research (Polit & Beck, 2008). The **naturalistic paradigm** is often considered to be an alternative paradigm to the positivist one. It maintains that there are multiple interpretations of reality and that the goal of research is to understand how individuals construct reality within their context. It is subjective and is associated with qualitative research (Letherby, 2003; Walsh & Wiggens, 2003).

The positivist research paradigm belongs to the scientific school of thought and its knowledge is usually derived in the form of randomised controlled trials (RCTs) and quasi-experiments (experimental research) and surveys in midwifery research. The naturalistic paradigm beliefs are focused on the human experience, thoughts and feelings and research is usually gathered using the research methods of ethnography, phenomenology, and grounded theory.

Qualitative and quantitative approaches can also be referred to as paradigms (Cluett & Bluff, 2006), but here, to aid your understanding, they are referred to as approaches. They help to structure the type of knowledge that needs to be acquired and different research methods are aligned to the different approaches, e.g. positivist paradigm, quantitative approach, randomised control trial or alternatively naturalistic paradigm, qualitative approach, ethnography.

In the **qualitative approach** the type of knowledge to be acquired focuses on experiences, thoughts, feelings and behaviour, and acknowledges the use of subjectivity (Davies, 2007). Its aim is to understand from the perspective of study participants, the meaning of their experiences (Robinson, 2002). An example of a qualitative study could be women's experiences of breastfeeding. The **quantitative approach** is centred within empirical knowledge, facts, figures, experiments, and is therefore tangible and objective (Begley, 2008). Its intention is to produce data that can be '*counted, measured, weighed, enumerated and so manipulated and compared mathematically*' (Grix, 2004, p. 173). An example of a quantitative study could be to measure the effectiveness of skin-to-skin contact on the length of breastfeeding.

Research language can be a bit overwhelming and to add to this further the student researcher must have an understanding of the following terms: epistemology, ontology, methodology, method and research design.

Epistemology is the study of the nature of knowledge, how we understand our world and relate this to the understanding of theories of what makes up

Table 1.1 Two possible research designs.

Paradigm	*Approach*	*Methodology*	*Data collection tools*	*Data analysis*
Naturalistic	Qualitative	Ethnography	Observation Field diaries Interviews	Thematic analysis
Positivist	Quantitative	Survey	Questionnaire	Descriptive statistics

knowledge (Cluett & Buff, 2006). It concerns '*questioning and understanding how we know what we know*' (Griffiths, 2009, p. 193). **Ontology** concerns '*our views about what constitutes the social world and how we can go about studying it*' (Barbour, 2008, p. 296). Walsh and Wiggens (2003, p. 3) suggest that '*ontological assumptions are the researcher's views about the nature of reality and epistemological assumptions are the researcher's decisions about how best to gather data on this reality*'.

In research texts there is quite often an intertwined use of the terms methodology and method, which can be confusing (Grix, 2004). To clarify, **methodology** refers to the theoretical and philosophical underpinnings of the research and the knowledge that is to be determined or theory developed (Barbour, 2008). **Method** comprises the procedural steps for data collection and data analysis (Brewer, 2000) and is the acquisition and analysis of that knowledge (Williams, 2008). Clark (2000, p. 46) suggests that clarity should be sought, when researchers are publishing their studies, regarding the use of the terms methodology and method as some researchers have failed to distinguish the difference between the research methodology (e.g. RCT, survey, ethnography) and the research methods used to collect and analyse the data (such as a questionnaire, a semi-structured interview or a rating scale). The methods selected are usually determined by the methodology chosen (Grix, 2004). The **research design** therefore encompasses all of the above, which is a detailed plan of the research study. Table 1.1 gives an outline of two research designs.

Audit and research

Audit and research share some similarities:

- Both involve answering specific questions which can relate to the quality of maternity care and practice.
- Both can be carried out either prospectively or retrospectively.
- Both involve some type of sampling, use of questionnaires for data collection and some form of analysis.
- Both have implications for midwifery practice.

Audit and research, however, involve different processes and work towards different goals.

What is audit?

A simple definition is that audit is a process of finding out whether systems or interventions that are evidence based are being carried out effectively.

The National Institute for Health & Clinical Excellence (NICE) describes clinical audit as:

> A quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structure, processes and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual, team, or service level and further monitoring is used to confirm improvement in healthcare delivery.
>
> Principles for Best Practice in Clinical Audit, NICE, 2002, p. 1

See Box 1.2.

The following ten statements clarify what audit is:

- Audit informs us if best practice is being carried out or not.
- Audit can identify systems failures and then make recommendations.
- Audit measures against set standards.
- Audit can measure the effects of a standardised treatment in use.
- Audit does not involve testing out new ideas, theories, treatments or interventions.
- Audit does not involve randomising service users to different treatment groups.
- Audit usually involves basic descriptive statistical analysis of data.
- Audit results are usually applicable to the local settings were the audit was carried out.
- Audit can also be undertaken nationally to compare systems and practices of local areas.
- Audit does not need ethical approval.

What is research?

'*Research is the diligent, systematic inquiry or investigation to validate and refine existing knowledge and generate new knowledge*' (Burns & Grove, 2009, p. 2). It can be defined further as the systematic collection of information to determine either an answer to a question, to test a theory or to verify a hunch (Lobiondo-Wood *et al*., 2002).

A simple definition is that research can involve investigating or exploring new ideas, theories or concepts, views and experiences, treatments or interventions to create new knowledge to inform education and promote best practice.

The following ten statements clarify what research is:

- Research creates new knowledge about what works and what is wanted by a target population.
- Research can make inferences about what will work for the population at large.
- Research can be based on a theory or hypothesis.

Box 1.2 An example of a clinical audit.

An acupuncturist midwife had an established clinic which provided pregnant women with the options of acupuncture, moxibustion and cupping therapies. In 2003, concerns about the evidence base and benefits of moxibustion led to it being suspended until a clinical audit was undertaken. Over an 18-month period a clinical audit was carried out by Calderdale and Huddersfield NHS Trust (2004). A review of the literature found that moxibustion reduced the need for External Cephalic Version (ECV), may be helpful to turn a breech presentation and no adverse effects were reported. Interestingly, during the audit period an increase in Caesarean Section (CS) for breech presentation when moxibustion therapy was discontinued prior to ECV being offered was reported. On the basis of this evidence permission was given to re-introduce this service for pregnant women.

Following this audit a Cochrane review has been carried out that examined the evidence investigating the effectiveness and safety of moxibustion on turning the baby from a breech position, the need for ECV, mode of birth and perinatal morbidity and mortality (Coyle *et al*., 2005). The evidence supported the clinical audit outcomes. Three trials were included in this review with a total of 597 women. The reviewers were unable to undertake a meta-analysis of the data from the trials due to inconsistencies and differences within the trial methodologies and interventions. However, they reported that moxibustion reduced the need for ECV (RR 0.47, 95% CI 0.33–0.66) and decreased the use of oxytocin before or during labour for women who had vaginal deliveries (RR 0.28, 95% CI 0.13–0.60). They concluded that moxibustion may be helpful in turning a breech baby when applied to the little toe but there was insufficient evidence to support its use in clinical practice and recommended further research and well designed randomised controlled trials in moxibustion.

This NHS trust is now planning to undertake further research into the effectiveness of moxibustion.

- Research can involve investigating the effects of a treatment or interventions.
- Research may involve both descriptive and inferential statistical analysis of data.
- Research may involve emerging themes and concepts to generate new knowledge.
- Research can gain deep insights into understanding service users' feelings, views and experiences.
- Research requires ethics committee approval.
- Research can identify the gaps in knowledge that need further investigation or exploration.
- Research can provide the best evidence to promote good practices and standards.

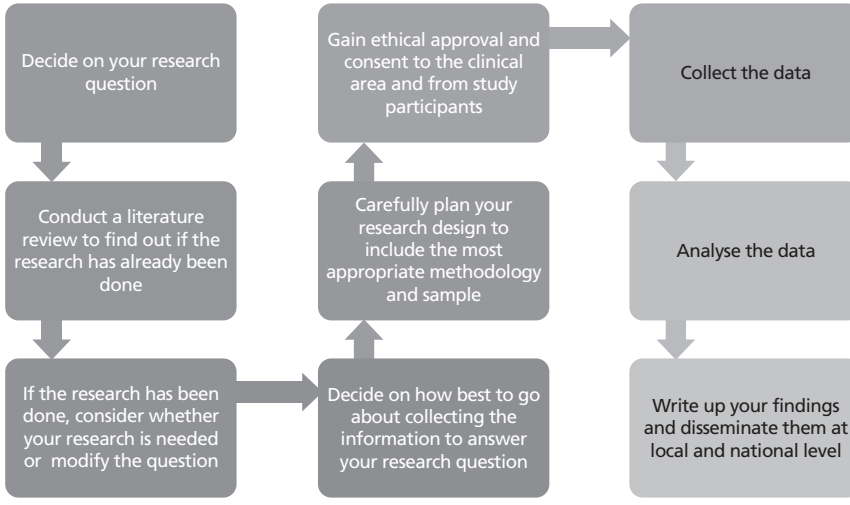

Figure 1.1 The research process.

Research–audit–audit–research cycle

Audit and research are intertwined. For research evidence to have an impact on maternity care and practice, audits have to be undertaken to monitor this. Research provides the evidence to promote best practice and enables the setting of standards to provide a high-quality service to women, their babies and families. Audit then plays an essential part and monitors the implementation of the evidence and seeks to find evidence that the standards are being carried out effectively and sufficiently. There is a research–audit–audit–research (RAAR) cycle, where research identifies areas for audit and then audit identifies areas for research.

Research process

A research study follows a structured process to access, collect and analyse information (Polit & Beck, 2006) and to verify the findings. Research can therefore be best described as a systematic process by which a question, a hunch or a theory can be identified, examined and analysed through a series of actions, in order to generate new knowledge or refine existing information. Figure 1.1 depicts the process of research as a series of actions.

According to Watson and Keady (2008), research can serve two purposes; these are to solve clinical problems and to fill gaps in knowledge. However, research really does not serve a purpose unless those findings are shared with others, which can be at local level with colleagues or to wider audiences such as publication in journals, and presentation at conferences. Research at its best can underpin good quality evidence-based practice which will be discussed later in this chapter.

The systematic approach adhered to throughout a research study will assist you to progress steadily (Box 1.3).

Box 1.3 Research process – ten points to remember.

- Define the subject and purpose.
- Study the research literature.
- Plan the research approach and methodology.
- Consider the ethical and governance aspects of the study.
- Carry out a pilot study.
- Collect the data.
- Analyse the data.
- Formulate conclusions.
- Discuss implications for midwifery practice.
- Disseminate (publication/conferences).

Research and Development Information (RDInfo)

The RDInfo website is an excellent resource for you to access as it provides excellent information on the research process and takes you through a step-by-step guide. The guide is clearly written and covers the systematic process of research which will help you methodically work through the different stages of the research process. For further information see http://www.RDInfo.

User involvement

It is considered good practice to involve women, their partners and family members, if applicable, in all stages of the research process. By doing so you will improve the quality of your research study as this will help you to gain an understanding from their perspective of what they deem to be important and necessary. This in turn should then increase the likelihood of you completing your research successfully as you have listened to their views and what they feel will make a difference to their care or involvement.

RDInfo suggests that you can distinctly involve service users in four stages of the research process:

- Setting the research agenda.
- Developing the proposal.
- During the conduct of the project.
- Disseminating results.

Setting the research agenda

Involve users in decision making and consider what is important to them and not just of academic or research interest to you.

Developing the proposal

Involving people who may participate in your research or who have an interest in this area will help you to design a more pragmatic study with a higher rate of success.

During the conduct of the project
Check things out and ask service users and participants as this will help you identify any potential problems that may arise and give you an insight into how you can address these and make improvements. This will help you to complete your study successfully and on time.

Disseminating results
Remember to disseminate your results widely and not just to the professionals; you should include users as this will help you bridge the theory–practice gap. It is interesting to note that funding bodies now require evidence of, firstly, how users have been consulted and involved in the designing of a research proposal, secondly, how they have contributed to the undertaking of the research study and, thirdly, how they are going to be involved in your dissemination plan.

INVOLVE

In the UK, INVOLVE is a well established national advisory group of about 20 members involving users, researchers and representatives from the public and voluntary sector. INVOLVE was set up in 1996 and is funded by the Department of Health. INVOLVE aims to promote and support active user involvement in research that is carried out by NHS, public health and social care services.

The chief executive of the Terence Higgins Trust and chair of INVOLVE, Nick Partridge, states on their website, '*When the public get involved in research it becomes more relevant to people's needs, more reliable and more likely to be used.*'

This group has produced several publications to guide researchers, users and funding organisations, has a mailing list and provides a quarterly newsletter. For further information see INVOLVE'S website http://www.invo.org.uk/.

Service development projects

Service development projects are often used to implement good practice and will involve some form of evaluation of the initiative. Again, you need to consider user involvement. However, if your project is not considered to be research then you do not need ethical approval but will need to consider good practice and clinical governance aspects.

Box 1.4 is an example of a successful midwifery-led service development project (Steen, 2007).

Introducing qualitative research

Qualitative research involves exploring opinions, behaviours and experiences from the participants' points of view, thereby determining what something means from the perspectives of those taking part in the research study. Subjectivity is integral to the researcher's role in this approach as it allows for better understanding of the subject under investigation by the researcher (Robinson, 2002).

Box 1.4 The Maternal Health & Well-Being Project.

Background: The Department of Health has acknowledged that 'Healthy mothers are key for giving healthy babies a healthy start in life' (Department of Health, 2004).

Service development project: A health and fitness initiative for mums-to-be and new mums was developed in collaboration with the maternity services of a large NHS trust and the health and leisure services of a local authority. Following a successful pilot study, approval to continue and evaluate the initiative for a 1-year period was given.

The aim: To promote health and fitness during pregnancy, prepare for birth and then maintain health and fitness after childbirth.

The initiative: Women attended a rolling on programme of 6 antenatal workshop/exercise classes from 16 weeks gestation. These women then returned to the postnatal workshop/exercise classes 2 weeks after birth with their newborn baby. A midwife and fitness instructor at a local sports centre ran the sessions. 'Prescription for Activity' passes were then offered to women on completion of the programme to encourage them to continue to exercise for a further 12 weeks and attend mainstream classes and the gym.

Findings: Health and well-being benefits were reported on evaluation of the workshops and exercise classes. Women appear to have enjoyed exercising in a friendly environment, with adequate facilities and at an affordable cost. A majority of women continued to exercise and many of their partners also began to exercise. See poster below and www.bbc.co.uk/leeds/features/living/fitness/pregnancy_pilates.shtml.

Box 1.5 Characteristics of the qualitative approach.

- Inductive.
- Explores – thoughts, feelings, experiences, beliefs and social interactions.
- Describes and interprets.
- Sampling is usually purposive, but convenience, snowballing, open and theoretical can also be utilised.
- Information can be collected by observation, interviews and visual analysis of documents or objects.
- Analysis of the data – usually thematic analysis and more specific analysis for phenomenology and grounded theory.
- Subjective.
- Not generalisable.

Some researchers may consider it to be an easier option than quantitative research, but having conducted both qualitative and quantitative studies, we know it is not. It can be very time consuming, but the experience and sense of satisfaction in producing research whose whole basis is the participants' experience is very rewarding (Mapp & Hudson, 2005). Box 1.5 describes the characteristics of the qualitative approach.

Reflexivity is integral to qualitative research. It involves researchers acknowledging their personal biases, therefore being self-aware. It can ensure trustworthiness of research findings (Kingdon, 2005). It is a process that should be ongoing throughout the whole of the research process.

Within qualitative research, the three major research methods are phenomenology, ethnography and grounded theory, and these will be the focus of this section. Feminist research, narrative research and historical research will be described briefly. Action research and Delphi studies are also mentioned as they can both use a flexible approach and can utilise qualitative and quantitative methods, though action research tends to be viewed as a qualitative approach and Delphi techniques tend to be linked more with the quantitative approach.

Phenomenology

Phenomenology is derived from philosophy and provides a framework for a method of research (Denscombe, 2003). Phenomenology as a philosophical method of inquiry was developed by the German philosopher Edmond Husserl (1859–1938). He is acknowledged as the founder of the phenomenological movement (Koch, 1995). The phenomenological term 'lived experience' is synonymous with this research approach. Husserl's drive for phenomenological enquiry was derived from the belief that experimental scientific research could not be used to study all human phenomena and had become so detached from the fabric of the human experience, that it was in

fact obstructing our understanding of ourselves (Crotty, 1996). He felt driven to establish a rigorous science that found truth in the lived experience (LoBiondo-Wood & Haber, 2002).

The goal of Husserlian phenomenological enquiry is to fully describe a lived experience and to develop insights from the perspectives of those involved, by them detailing their lived experience of a particular time in their lives (Clark, 2000). It stresses that only those that have experienced phenomena can communicate them to the outside world (Todres & Holloway, 2004). It therefore answers questions of meaning, in understanding an experience from those who have experienced it (Mapp, 2008).

Husserlian phenomenology is about searching for meanings and essences of the experience, and advocates 'bracketing', which is the suspension of the researcher's own preconceptions, beliefs or prejudices so that they do not influence the description of the respondents' experience (Parahoo, 2006). It obtains descriptions of experiences through first-person accounts during informal one-to-one interviews. These are then transcribed and analysed for themes and meanings (Moustakas, 1994), allowing the experience to be understood.

Although Husserl founded the phenomenological approach (Polit *et al*., 2001), it is not the single phenomenological method. Other phenomenologists who have shaped this approach are Gabriel Marcel (1889–1973), Jean-Paul Sartre (1905–1980) and Maurice Merleau-Ponty (1908–1961). According to Cohen (2000) they are referred to as the French phase of phenomenology, whereas Husserl and Martin Heidegger (who was mentored by the former) are the German phase.

Heidegger developed another phenomenological approach known as 'hermeneutics', meaning interpretation (Annells, 1996). It differs from Husserlian phenomenology, in that the researchers bring their own understanding and experiences to the research process, whereas the former advocates bracketing (Walters, 1995). Husserlian phenomenology therefore requires the researcher to suspend personal beliefs about the research phenomena, whilst seeking to describe the participants' experiences. Conversely, Heideggerian phenomenology suggests that researchers interpret the data collected in terms of their own personal experiences (Mapp, 2008).

There are three schools of phenomenology (Polit *et al*., 2001), and the first two are the focus for midwifery and nursing research (Mapp, 2008). The first school follows the Husserlian approach; its main focus is on description. The second school is guided by the Heideggerian approach, utilising interpretive hermeneutics as its basis. The third school is referred to as the Dutch or Utrecht school, its approach combines the characteristics of descriptive and interpretive phenomenology (Holloway & Wheeler, 2002).

> Phenomenology has different applications dependent on the authors who have founded and developed it. This should therefore be recognized in midwifery research to increase knowledge and the use of the most appropriate phenomenological research approach for the phenomenon to be studied. Following a Husserlian approach the researcher will aim to 'bracket' her beliefs to describe

Box 1.6 An example of a midwifery Husserlian phenomenology study.

Feelings and fears during obstetric emergencies Part 1 (Mapp & Hudson, 2005).

This study was of a purposive sample of ten women who detailed their lived experiences of an obstetric emergency. Data collection was unstructured one-to-one interviews. Colaizzi's method of data analysis was utilised.

> the experience people have had, as opposed to using a Heiderggerian approach, whereby the experiences are interpreted and analysed through the researcher's own knowledge and experience.
>
> Mapp, 2008, p. 309

An example of a Husserlian study is given in Box 1.6.

As phenomenology requires the exploration of the whole person, it is deemed to be particularly suitable in studying phenomena relative to midwifery. It enables midwives to study in depth the childbirth process directly in context with those who are experiencing it. In particular it facilitates a woman's unique experience of childbirth which would otherwise be unknown, and which can potentially assist improvements in practice (Mapp, 2008).

Ethnography

Ethnography can be defined as '*a qualitative research approach developed by anthropologists with the purpose of describing an aspect of culture, but is also aimed at learning about the culture or factor being studied*' (Lanoe, 2002, p. 94). It is considered to be the oldest of the qualitative research methodologies. It has been in use since ancient times, the Greeks and the Romans wrote descriptions of cultures they encountered. The term ethnography is derived from Greek and it means a description of people (Holloway & Wheeler, 2002). Ethnography as a research design aims to be holistic by studying '*naturally occurring human behaviour through observation*' (Brink & Edgecombe, 2003, p. 1028).

Ethnography has its roots in anthropology, but it is becoming increasingly popular in the field of healthcare research to study behaviour and social interactions, and specifically in midwifery, to explore the culture of childbirth (Clark, 2000). Anthropologists use ethnography to produce knowledge, whereas health researchers aim to produce knowledge to improve practice (Holloway & Wheeler, 2002). Ethnography appears, therefore, to be well suited to healthcare research, whereby the researchers are not just describing behaviour, but are aiming to make sense of it with the potential for making improvements in practice (Holloway & Todres, 2006).

Ethnography came to public attention in the 1920s with the advent of anthropologists studying ancient tribes and cultures, pith-helmeted explorers expounded by the works of Malinowski (1922) and Mead (1943) (cited by

Box 1.7 An example of an ethnographic midwifery study.

An ethnography of experienced midwives caring for women in labour (Price & Johnson, 2006).

This study used a purposive sample of six midwives. Data collection included participant observation, to study encounters between midwives and the women in their care, and semi-structured interviews. The interviews were felt to be a vital component to the research process to confirm the researchers' interpretations of the behaviour observed. Thematic analysis was used to analyse the data.

Box 1.8 Types of ethnography (Roberts, 2009, p. 292).

- Classical ethnography – prolonged contact with a group, which is studied.
- Systematic ethnography – attempts to define and delineate a specific cultural structure.
- Interpretive ethnography – attempts to discover the meanings of social interaction and behaviour (Donovan, 2006, p. 174).
- Descriptive ethnography – describes what is happening.
- Critical ethnography – emphasises the subjectivity of the researcher and focuses on power interactions (Holloway & Todres, 2006).

Denscombe, 2003). Ethnography did not find its roots in applied midwifery research until the late 1980s and since then it has gained in popularity and has been used to explore the culture of childbirth and the education of student midwives (Davies, 1996; John & Parsons, 2006; Price & Johnson, 2006). The two pivotal midwifery ethnographic studies which are considered to have given credence to ethnography as a research methodology, were Mavis Kirkham's (1987) PhD, *Basic supportive care in labour: interaction with women and around women in labour* (cited by Donovan, 2006) and Sheila Hunt's study of two labour wards, published in *The Social Meaning of Midwifery* (Hunt & Symonds, 1995). See Box 1.7.

The focus of ethnography is on '*individuals, not in isolation, but in relation to their organisations, communities, customs and culture*' (Clark, 2000, p. 44). It is a research methodology (Lindsay, 2007) that can enable researchers to make sense of people's actions by observing them in the context of their environment, (Varcoe *et al*., 2003). This then allows for an understanding of their behaviour within their cultural arena, such as midwives working on a labour ward. This demonstrates the whole essence of ethnography, which allows for the researcher to become immersed within the culture to gain an understanding of the behaviour for that particular group of people. It must be stressed, however, that within ethnography there are different types (Roberts, 2009) and Box 1.8 gives an outline of the various characteristics.

Grounded theory

Grounded theory focuses on generating a theory from research data, to describe and explain what is happening in a social setting or interaction (Rees, 2003). The researcher has an area of research interest and is then led by the research data (Parahoo, 2006). This is in contrast to other research methodologies, when the purpose is either to test a hypothesis or answer a question at the start of the research process (Davies, 2007).

Grounded theory as a research methodology was discovered by social scientists Barney Glaser & Anselm Strauss in 1967. Their book *The Discovery of Grounded Theory* (Glaser & Strauss, 1967) was their only publication together on the subject. Since then they have published separately on this topic, with apparent similar conceptual ideologies, but differing applications (Strauss & Corbin 1997; Glaser, 1998; Strauss & Corbin, 1998; Glaser, 2001).

Symbolic interactionism is a key feature of grounded theory (Polit & Beck, 2006, p. 222), '*which focuses on the manner in which people make sense of social interactions and the interpretations they attach to social symbols e.g. language*'. Grounded theory therefore seeks to identify and explain what is happening in a social setting (Roberts, 2008). It aims to be true to the reality of the situation/interaction under investigation (Letherby, 2003) and is being increasingly used in healthcare research (Dykes, 2004).

Grounded theory can be used within both the quantitative and qualitative approaches (Boychuk Duchscher & Morgan, 2004). However, it is most commonly found in the latter, due to the flexibility that is required of its research design (Bluff, 2006). It differs from other research methodologies in that a literature review is not usually conducted until the conclusion of the study, so that the research is conducted without any preconceived theories, therefore allowing ideas to develop (Grix, 2004). Grounded theory also differs in that data collection and data analysis proceed in parallel from the beginning of the study and interact continuously to allow the data to lead the researcher in developing new theories (Strauss & Corbin, 1998).

Grounded theory is a research methodology that can provide a framework for midwifery researchers to produce interesting and innovative research. It can start with an area of interest, with the researchers being open to being led wherever the data will take them, thus providing new perspectives on midwifery care (Roberts, 2008). Box 1.9 gives an example of a midwifery grounded theory study.

Feminist research

Feminist research is not just research on women conducted by women; it is much more complex than that. It is about recognising oppression and the reasons for it, valuing women's experiences and understanding the actions that can be taken to change the situation (Kralik & van Loon, 2008). Feminist research studies '*are based on women making sense of their own lives and facilitating collective action to change their social situation*'. Therefore an objective of this research perspective is to create change and not just the creation of knowledge (Kralik & van Loon, 2008, p. 42). Feminism is the 'theoretical perspective' and

Box 1.9 An example of a midwifery grounded theory study.

Breaking the rules in baby-feeding practice in the UK: deviance and good practice? (Furber & Thomson, 2006).

This study used theoretical sampling and 30 midwives volunteered to participate. Data collection was semi-structured interviews and field notes completed at the conclusion of the interview. Data analysis used was specific to grounded theory, constant comparative analysis method.

Box 1.10 An example of a midwifery feminist study.

The practice setting: site of ethical conflict for some mothers and midwives (Thompson, 2003).

This study was conducted from a feminist perspective. Snowball sampling was used; eight childbearing women and eight midwives participated. Data collection involved the personal narratives of mothers and midwives about what they considered to be ethical conflicts. Data analysis was guided by feminist ethics and the participants and researcher jointly analysed and interpreted the data for emerging themes (thematic analysis).

encompassed within this are many different 'schools' of feminism. If the researcher has therefore decided to conduct a feminist study, she then must consider the feminist perspective that she will follow and the most appropriate research methodology that matches the study's aims (Dykes, 2004). Box 1.10 gives an example of a midwifery feminist study.

Historical research

Historical research is about examining events in the past that are related to midwifery practice. It can enable greater understanding of the midwifery profession. More recently, this type of research has moved to become 'interpretive history', this means to try and search for meanings and therefore understanding of events in the past from the viewpoint of the present (Burns & Grove, 2009). Information can be collected from many different sources: books, journals, documentaries, films, newspapers, written narratives, diaries, songs, interviews (oral histories), etc. Therefore, the data collected will be realised in a textual format, e.g. written words that will require analysis. Analysis within this context can take different forms depending on the type of text presented, e.g. discourse analysis or textual analysis. Discourse analysis (Rugg & Petrie, 2007) would be appropriate for dialogue or conversations, whereas textual analysis may be appropriate for newspaper coverage (McKee, 2003). Engaging in historical research can be a time consuming process that needs to be systematic and rigorous in its approach and application (Fealy,

Box 1.11 An example of a midwifery historical study.

Using oral history in midwifery (Reid, 2004).

This article describes a study that gained oral accounts of the history of Scottish midwives in the twentieth century. Snowball sampling was used. Forty-five midwives took part, ranging in qualification dates from 1928 to 1981. Data collection, included interview narratives – the participants 'told their stories'; however, some open questions were also used to guide the interview (interview guide used). Data collection produced a rich description of midwifery history. Data analysis produced specific oral testimonies on certain issues highlighted in the transcriptions (thematic analysis).

Box 1.12 An example of a midwifery narrative study.

Why women choose midwifery: a narrative analysis of motivations and understandings in a group of first-year student midwives (Williams, 2006).

The study included a self-selected sample of 15 first-year student midwives. Data collection was individual interviews – narrative approach with an interview guide. Data analysis was done by narrative analysis (thematic analysis).

2008), yet it can produce very interesting and worthwhile information. Box 1.11 gives an example of a midwifery historical study.

Narrative research

Narrative research is essentially the collection and analysis of stories. In the last decade it has developed into an accepted approach in qualitative studies (Hurtwitz *et al*., 2004) and become popular in health research (Griffiths, 2009). '*A story narrative is a personal account of a sequence of actions or events, told to another person (or written for a reader)*'. Narrative research is not just about someone describing events, but it is about how they have made sense/understood what happened and how it made them feel (Greenhalgh & Wengraf, 2008, p. 244). Narrative '*analysis seeks meaning and purpose in the telling of the story*' (Griffiths, 2009, p. 196). Data analysis utilised for this approach would be thematic analysis. Box 1.12 gives an example of a midwifery narrative study.

Action research (flexible approach)

The focus on change is key to the action research process. Action research was developed by Kurt Lewins in the 1940s to resolve social conflicts. '*The primary purpose of action-based research is to bring about change in specific situations, in local systems and real-world environments with aims to solve real problems*' (Parkin, 2009, p. 20).

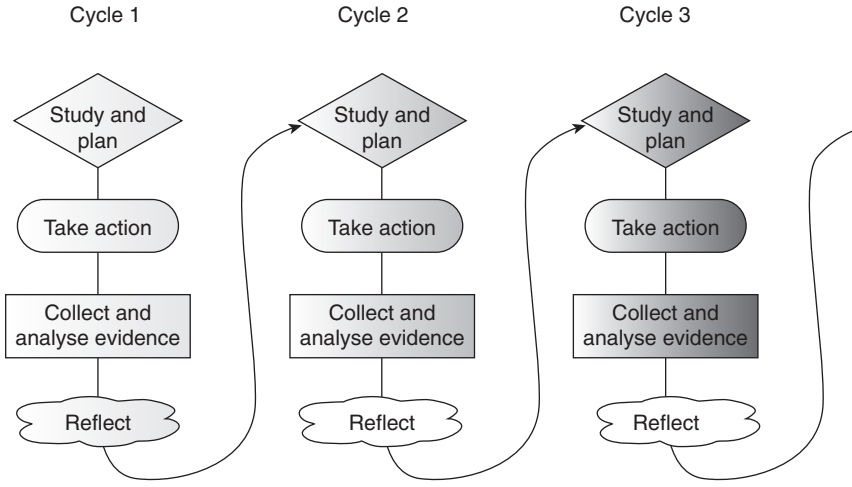

Figure 1.2 Progressive problem solving with action research. Source: http://cadres.pepperdine.edu/ccar/define.html. Reproduced with permission from Dr Margaret Riel.

Action researchers are part of the situation and together with practitioners in the clinical area, they identify a problem, initiate change, gather the evidence to assess the effectiveness of the change, make further refinements and assessments until an improvement/benefit is demonstrated (Waterman & Hope, 2008). This process is referred to as the action research cycle or flexible spiral process (Blaxter *et al*., 2006). Figure 1.2 is a depiction of this process (Reil, 2007).

Action research can be broadly assigned to two types. The first is where an expert researcher leads the process with the involvement of the practitioners being studied (action research). Secondly, there is participatory action research, where the process is led by the practitioners and the distinction between (expert) researcher and practitioner is removed, however the practitioners can ask for advice from the researcher without rescinding control (Lindsay, 2007). Data collection can include both qualitative and quantitative methods (Polit & Beck, 2008). See Box 1.13 for an example of a midwifery action research study.

Delphi study (flexible approach)

A Delphi study may be seen as a structured process within which qualitative, quantitative or mixed methods can be used to promote an interactive forecasting approach which relies on a panel of independent experts (Skulmoski *et al*., 2007). These experts complete questionnaires in two or more rounds. After each round, a researcher provides an anonymous summary of the combined experts' answers or what are often referred to as forecasts (estimations) from the previous round and the reasons given to support their judgements. The experts are then encouraged to revise their earlier answers in light of the

Box 1.13 An example of a midwifery action research project.

Promoting midwifery-led care within an obstetric-led unit (Walton *et al.*, 2005).

All midwives at the maternity unit were invited to form the 'Normal Birth Strategy Group'. Educational workshops were conducted to enable midwives to identify the skills they needed to increase normal birth rates, guidelines were developed, and there was a pilot scheme of two midwifery-led rooms on the unit. Both qualitative and quantitative approaches were utilised for data collection and analysis (questionnaires, interviews, audit, reflection and evaluation).

responses from other experts of the panel. This approach aims to decrease the range of responses during the process and for the panel of experts to unite towards similar responses. The methodology has predetermined criteria which indicate when to stop collecting data, such as the number of rounds, when a level of consensus has been reached and the findings are consistent. Average scores and the mean or median are scoring high levels of agreement. The Delphi method is based on the assumption that group judgements are more credible than individual judgements.

> A process of developing ideas and forming a consensus about an issue among a group of people without them being in contact with each other.
>
> Griffiths, 2009, p. 192

The group of people is referred to as a panel of experts on the topic of the research question (Hasson *et al.*, 2000). The information can be gathered by post, face-to-face panels and more popularly by e-mail; the questions posed to the experts are usually collated in a questionnaire. The researcher identifies the level of consensus among the experts' responses and the original, and combined analysed answers are returned to the panel for them to further rank/rate them. This process of returning the analysed responses to the panel can happen many times until the researcher determines that a consensus has been reached (Walsh & Wiggens, 2003). As to the size of the sample (panel of experts), there appears no clear guidance, however McKenna and Keeney (2008) would suggest that a small group of interested experts would achieve a good response rate and therefore reach a consensus, rather than a large group whose response may be poor. See Box 1.14.

Introducing quantitative research

Quantitative research is a general term used to describe research that aims to measure concepts or events as objectively as is feasibly possible by numerical and statistical means.

Box 1.14 An example of a midwifery Delphi study.

Registration requirements for midwives in Australia: a Delphi study (Pincombe *et al*., 2007).

The sample consisted of a panel of 36 experts. They were invited to participate by a letter, the aim being to gain a consensus on the minimum requirements for midwifery registration. Data collection involved three rounds of postal questionnaires which included both qualitative and quantitative questions for the panel to reach a consensus. Data analysis used thematic content analysis and descriptive statistics.

It is important from the outset that you are able to distinguish between what a quantitative research approach is and what quantitative methods and studies are available for you to use. Generally speaking, a research approach describes the whole design of the research study; this includes its philosophical stance, i.e. positivism, the methodology, type of data to be collected and analysed and how the results will be presented. This approach is often referred to as being reductionist, deterministic or deductive in its approach (Parahoo, 2006). It can involve measuring how variables interact (cause and effect) and also make comparisons and find correlations.

A quantitative approach involves stating a research question or a hypothesis and then designing the study to collect data to undertake some sort of numerical analysis to answer the research question or provide evidence to confirm or refute a hypothesis. A quantitative method is used when there is a need to provide accurate and precise measurements such as facts and figures to help us understand an issue and how to resolve it. Remember the whole process should reflect objectivity and provide valid and reliable results. However, realistically this is not as straightforward as it initially appears and all research, whether it uses a quantitative or qualitative approach, will have limitations and biases that need to be considered. A researcher must consider how to minimise the limitations and biases as far as possible when designing the study. Quantitative research will use a measurement where numbers can be genuinely real numbers such as maternal age or a baby's birth weight or be assigned to represent people, objects, events, attitudes and levels of severity, intensity or agreement. To promote objectivity data collection tools such as structured questionnaires and structured interviews are used to collect the data; sampling methods such as random sampling and sample size are also used and estimated to further promote objectivity. See Chapter 6.

Data are analysed in numbers (often referred to as 'number crunching') and will describe the distribution in a population and determine whether there are any relationships between variables measured to understand the phenomena being investigated. Often a researcher will construct or use valid numerical or rating scales to help measure and interpret the data. Once the numerical data have been analysed they have to be described and discussed; graphs and

charts are helpful to interpret the findings visually. Data terms such as frequencies, proportions, percentages, amounts, prevalence, incidences, trends and patterns are associated with quantitative research.

Quantitative research studies

There are several types of quantitative research studies that can be non-experimental (descriptive or observational) or experimental (true experiments or comparative studies) in their approach and can be used to find evidence to inform clinical practice, test a treatment or intervention and indicate the need for further research that may involve different research approaches.

Non-experimental design

Case studies

Case studies can involve a participant or participants who already have a social habit, condition or illness and are compared with participant(s) who do not.

For example: a study on pregnant women who continue to smoke during pregnancy; they are asked their reasons why and the answers are then compared with a sample of women who have stopped smoking during pregnancy.

The main advantages of case studies are:

- They can be carried out relatively quickly.
- Asking pregnant women about their reasons for doing something, e.g. smoking, will help a researcher to find out quickly some answers that otherwise could take a lot longer to ascertain with other research methods.
- The research method is straightforward and a researcher does not need a control group or to randomly allocate women.
- Women are simply approached at booking to participate and if consent is given are then asked a few questions.

Case studies, however, provide limited evidence and there is potential bias concerning recall and selection. The studies are not generalisible to the population at large but can be undertaken prior to a cohort study or randomised controlled study to indicate the need for further research.

Case series

Case series and case reports can consist of either a collection of records/reports on conditions and treatments or therapies that an individual woman receives, or of records/reports on a single woman.

For example: at an antenatal booking appointment a woman presents with a rare condition that you have never heard of before and you need to find information and guidance on how to care for her. A search for case series or case records/reports may reveal information and guidance that will assist you to plan her care. Case series and case record/reports use no control groups with which to compare outcomes and therefore provide limited evidence.

Box 1.15 Example of a midwifery cohort study.

Dahlen *et al*. (2007) carried out a prospective cohort study of risk factors for severe perineal trauma (third- and fourth-degree tears) during childbirth over a 2-year period. A hospital's computerised obstetric information system was used and midwives were asked to comment on possible reasons for severe perineal trauma. Data were prospectively gathered on 6595 women who gave birth from 1 April, 1998 to 31 March, 2000 and analysed following the exclusion of women who had either an emergency or elective Caesarean section. The primary outcome was the presence or absence of severe perineal trauma for identified risk factors. The overall incidence of severe perineal trauma involved 134 (2%) of women. Of these women 122 (91%) had third-degree tears and 12 (9%) had fourth-degree tears. Primiparity, instrumental delivery, Asian ethnicity and large babies were associated with an elevated risk of severe perineal trauma and the researchers concluded that these findings confirm current knowledge. Lack of effective communication with the woman during the birth, different birth positions, delivery technique, ethnicity and obstetric influences were suggested by midwives as some reasons for the incidence of severe perineal trauma.

Cohort studies

A cohort study can involve a group of participants who have a condition or receive a particular treatment/intervention and are followed up over a long period of time and compared with a group who do not have the condition or receive the treatment/intervention under investigation.

For example: a follow-up study would compare the group of women who continued to smoke during pregnancy with the group who did not and monitor any health problems they develop over time. Cohort studies are not as reliable as randomised controlled studies, since the two groups may differ and random allocation and confounding variables are not controlled for.

The main disadvantage with cohort studies is the duration of time. Many changes (social, physical and/or environmental) can occur during the study follow-up period. For example, women can move away, have other children, divorce, remarry, develop illnesses, receive treatments, and even die. See Box 1.15.

Prospective studies

Prospective studies look at data that are going to be generated, the events having not yet occurred. A midwifery example that challenged evidence reported by Friedman (1954), who developed what are known as the 'Friedman Curves' of labour (based on a sample of only 100 women and some of the sample had oxytocin augmentation of their labours), has made an impact on how we assess and interpret the length of labour. See Box 1.16.

Box 1.16 How long is normal labour?

Albers *et al*. (1996) and Albers (1999) assessed the length of first and second stages of labour in two studies. Women who had a normal birth (at term, spontaneous onset of labour, cephalic presentation, singleton, no medical problems and no induction or augmentation of labour or epidural) were included and descriptive data were measured. These studies found that women who had a first stage with a normal limit was twice that found by Friedman but length of second stage was similar:

Primigravidae:	First stage 19.4/17.5/8.5 (hour)	Second stage 147/147/150 (minute)
Multigravidae:	First stage 13.7/13.8/7.0 (hour)	Second stage 57/64/60 (minute)

Basically, this indicated that the normal progress in the first stage of labour in the samples studied was on average 0.5 cm an hour of cervical dilation, which was less than half the rate that Friedman found (1 cm).

Retrospective studies

Retrospective studies look at recorded data that can be gathered from several written sources such as case notes, case studies, clinical reports, policies, guidelines and media material. The evidence can be analysed and comparisons can be made.

An example: a retrospective study undertaken by Nixon *et al*. (1998) compared outcomes of term infants of average birth weight with outcomes of large infants in a nurse-midwifery service. Data were retrieved from a computer data base that contained information from a data form routinely completed for all births. The study population included 2228, of which 322 (14.5%) of the infants weighed 4000 g or more. These large infants had birth outcomes comparable with those reported by others in the medical literature, suggesting that nurse-midwifery management, including consultation with physician colleagues, can be appropriate and safe.

Surveys

Survey methodology is a well known quantitative research method and aims to collect large amounts of data about a specific target population (population of interest). A survey is the most common questionnaire method used to describe social phenomena and has its origins in Victorian Britain (Bowling, 2009). Descriptive data describing populations and their attributes, such as level of knowledge, skills, views, attitudes, behaviours, incidences etc., can be recorded and inferences can be made to the total population. Researchers look for associations between variables and then patterns and trends. Government surveys are a good example of this methodology and these give information about national trends and issues. See Box 1.17.

Box 1.17 British Crime Survey (BCS) (2010).

The British Crime Survey (BCS) is an annual national survey that reports information gathered from face-to-face interviews of a sample of the general population residing in households in England and Wales. This information is combined with police recorded crime data that estimates the amount of crime in England and Wales.

The most recent *British Crime Survey*, reported by the Home Office (July 2010), involved 44 638 face-to-face interviews. This survey reported that men were twice as likely as women (4.2% compared with 1.8%) to have experienced violence in the year prior to the interview. Domestic violence accounted for 14% of all violent incidents and there was no change in the proportion of men or women experiencing domestic violence. Women were at greater risk than men of experiencing domestic violence (0.4% compared with 0.2%). Seven percent of women (16–59 years) compared with 4% of men (16–59 years) experienced domestic violence in the year prior to interview. This survey has implications for the health sector in general and within maternity services. Preventing future cases of domestic violence will reduce both maternal and fetal mortality and morbidity rates, yet there is limited research to demonstrate effective preventative measures. Presently, midwifery-led research within this neglected area is ongoing (Steen-Greaves *et al*., 2009) and could form the foundations for further research in this field.

Generally postal surveys are used with the inclusion of a stamped addressed envelope to encourage respondents to return the completed questionnaire, but telephone or face-to-face approaches are an alternative way to collect structured/semi-structured information. However, the internet has impacted on how surveys are conducted and on-line surveys are becoming more popular as they appear to be a faster and an easier method to collect data and for respondents to complete.

When undertaking a survey it is the researcher's responsibility to clearly define the target population and ensure a representative sample is recruited to be able to analyse the data and make inferences to the population at large. See Chapter 6, Basic Statistics section.

For example: a typical target population could be all pregnant women booked between January 2009 and December 2010 who are classified as high risk. Randomly selected consultant-led maternity units representing the four countries of the UK could be used to recruit a representative sample size from which inferences could be made to all consultant-led maternity units in the UK.

Surveys are helpful to ask the 'what', 'where', 'when' and 'how' but not as helpful to ask the 'why' types of questions (Bell, 2005). Surveys can establish associations but not causality and are susceptible to recall bias. See Box 1.18.

Box 1.18 A midwifery example of a survey undertaken by Lavender *et al.* (2005).

A postal survey conducted in England in January 2003 to May 2004 explored the views of consultant obstetricians and heads of midwifery on women's requests for Caesarean section without clinical indication and of a possible randomised controlled trial. Semi-structured questionnaires with closed and open questions were used to collect data and make comparisons between the two professional groups. Chi-square test was used to compare the proportion of respondents saying 'yes' to each question and open responses were analysed manually. A good response rate was reported, 660/924 (71%) eligible obstetricians and 123/169 (73%) midwives responded. Almost half of the obstetricians and a quarter of midwives believed that a woman should choose her method of delivery. A minority thought a trial was feasible, ethical, or desirable. Female obstetricians were less likely to support a trial than male ones. Whether or not the obstetrician and midwife had children did not influence their responses; nor did the type of unit in which the professionals worked.

Experimental design

Comparative studies

Comparative studies are studies where a planned treatment/intervention is given to a group of participants to assess its effect and compare this with a group that has not had the treatment/intervention. A comparative study where random allocation is not carried out is referred to as a quasi-experimental design.

An historical example: *Treatise of Scurvy* (Lind, 1753). In the eighteenth century James Lind spent 6 years studying scurvy in sailors aboard HMS Salisbury. He provided some sailors (not all) with a diet that included fruit and vegetables and then observed the results and concluded those in the 'intervention group' (fruit and vegetables) were more likely to remain free of scurvy. See web link for further information: http://www.jameslindlibrary.org/trial_records/17th_18th_Century/lind/lind_tp.html.

It is important to note that participants are not randomly assigned to a treatment/intervention group or comparison group(s). Some recruitment selection method, however, can be used such as, alternate days of the week, admission to a postnatal ward etc. This can introduce selection bias as the target population are not given an equal opportunity to be recruited to the study. See Box 1.19.

Pragmatic studies

Evidence-based guidelines and policies have encouraged the undertaking of pragmatic studies. A pragmatic trial is designed to measure whether an intervention/treatment is effective when used in usual circumstances. Participants should be representative of the target population to whom the

Box 1.19 A midwifery example of a comparative study (quasi-experimental design).

Barclay and Martin (1983) carried out a study which investigated the effectiveness of 'witch hazel', 'a no localised treatment', 'iced sitz bath', 'warm sitz bath', 'ray lamp' groups. Treatments were given three to four times daily for 10 minutes during the first 5 days following suturing of an episiotomy. Outcomes of pain, healing and infection rates were assessed from day 1 to day 5. Analgesia use was assessed and then classified as regular users if the woman had medication 4-hourly to 8-hourly for 24 hours or more. The researchers used a five-point verbal rating scale to assess the severity of pain and devised their own five-point ordinal scales to assess healing and signs of infection. The researchers reported that they would not be introducing the use of witch hazel as a means to alleviate perineal pain as it proved to be less beneficial on both subjective and objective measures when compared with iced sitz baths and no treatment.

intervention/treatment will be given in a real world setting if effectiveness is found. The participants maybe randomised or non-randomised.

Pre and post comparative studies

Data are collected before and then after a treatment/intervention is given to an experimental group. This type of study can involve one or more groups and comparisons are made. Sometimes, pre and post comparative studies are referred to as a time series study as participants are retested over a period of time. Ideally a researcher will take a set of baseline observations/tests before giving the treatment/intervention. Post observations/tests will also be measured over a period of time following the treatment/intervention being given to see if it makes a difference to the participants. This type of study is often used for service evaluation. See Box 1.20 for an example of a service evaluation pre and post comparative study.

Crossover trials

A crossover trial is a controlled trial where each participant, selected through a clear inclusion criteria, receives both the control and treatment/intervention in a random order, i.e. randomised to control group (A) then (crossover) and commence treatment/intervention group (B) and paired comparisons can be made.

The main advantages are:

- All participants are their own controls and this reduces the sample size.
- All participants receive treatment/intervention and blinding can happen.
- Statistical analysis can be undertaken and comparisons can be made.
- Participants may feel more willing to participate as they have an opportunity to try both treatments.

Box 1.20 An example of a service evaluation pre and post comparative study in New Zealand.

The nursing and midwifery clinical handover project compared pre and post-test data. This project involved staff and patients from three wards (one being a postnatal ward) at Waikato Hospital, New Zealand (Wynne-Jones, 2008). Pre-test involved investigating and exploring current practice of nursing/midwifery shift handover. Staff and patient feedback gave baseline data and there was evidence that the duration of handover and duplication of information was a common problem. Other factors were identified such as staff disruptive behaviour, poor punctuality, where and how the handover was carried out, i.e. office setting, at the bedside, by a coordinator to all staff, or one-to-one handovers. A new standardised process was implemented (succinct global handovers followed by bedside handover involving the patient and a checklist with reference to documentation). Post-test results demonstrated that most patients and staff supported bedside handovers but some concerns were raised with regards to privacy. Patients enjoyed being involved in their plan of care and information.

Box 1.21 An example of a crossover trial involving pregnant women in Canada.

A crossover trial compared the tolerability and compliance rates of 138 pregnant women attending outpatient clinics in Ontario and Quebec who received two types of multivitamin supplements (Ahn *et al.*, 2006). One supplement (PregVit®) contained a low dose of iron (35 mg) the other one (Materna®) contained a higher dose of iron (60 mg). Women were recruited at their first contact visit, asked to complete a standard questionnaire and randomised to receive either (PregVit®) or (Materna®) to be taken for 1 month. Women were asked to keep a diary of any adverse event (e.g. constipation, nausea and headache).One month later the supplement was changed over and given for 1 month. The results reported a significantly higher incidence of constipation as well as average duration of constipation when taking Materna®, the supplement containing a higher dose of iron when compared with PregVit®, the supplement containing a lower dose of iron.

However, this kind of trial cannot be used for treatments/interventions that have a permanent effect, and sometimes there has to be a time period between receiving the treatment/intervention. See Box 1.21.

Randomised controlled trials

Randomised controlled trials (RCTs) use an experimental design; a researcher investigates the effectiveness of two or more interventions/treatments in a number of individuals who have been randomly allocated to a control or experimental or standard regimen group. RCTs are considered to be a comparative study but the study must involve participants being allocated at

Box 1.22 An example of a randomised controlled trial.

Steen and Marchant (2007) carried out a RCT in a large maternity unit in the north of England. The aim of this RCT was to evaluate the effectiveness of two localised cooling treatments (ice pack and cooling gel pad) compared with a no localised treatment group at relieving perineal pain. Four hundred and fifty women who had either undergone a normal or instrumental delivery that required suturing of an episiotomy or second-degree tear were randomly assigned to one of the three treatment groups. The response rate was 316 out of 450 (71%). Perineal pain was most severe when sitting compared to lying down or walking and there was a significant difference between the three groups in estimates of overall pain when sitting on day four (Kruskal-Wallis test, df = 2 p = 0.01). Estimates of overall pain were lower in the gel pad group, and the difference between the three groups was significant at day five and day ten (Kruskal-Wallis test, df = 2 p = 0.02, p = 0.01). On days two, three and five, significance was measured when making a binary comparison of reported 'moderate' or 'severe' pain with 'none' or 'mild' (chi-square test, p = 0.04, p = 0.04, p = 0.02). Using a summary pain measurement, mothers experienced fewer painful days in the gel pad group but this did not reach statistical significance (Kruskal-Wallis test, df = 2 p = 0.26). The use of analgesia was reported to be similar in all three groups. Maternal satisfaction with their overall care was rated more highly in the gel pad group when compared to the two other groups (Kruskal-Wallis test, df = 2 p > 0.001). The conclusions were that cooling treatments can alleviate pain when compared to no localised treatment. Women appeared to find the cooling gel pad to be a more acceptable treatment.

random to an intervention/treatment group. RCTs measure and compare different outcomes when participants receive an intervention/treatment or not. An independent variable is manipulated to look for an effect on the dependent variable(s). RCTs are considered to be the most appropriate research method to investigate the effectiveness of a treatment or intervention and are the standard method of answering questions about the effectiveness of different treatments/interventions.

A randomised controlled study is one in which:

- There are two or more treatment/intervention groups (experimental) and a control group.
- The groups are 'like for like', i.e. they are similar in everything except the treatment/intervention they receive.
- The treatment/intervention group(s) receives the treatment/intervention under investigation, and the control group receives a no treatment, a standard regimen or placebo.
- Participants are randomly assigned to all groups.

See Box 1.22.

Box 1.23 An example of a cluster randomised controlled trial.

Moore *et al*. (2002) evaluated the effectiveness of a self-help approach to smoking in pregnancy. A cluster RCT with community midwife as the unit of randomisation was undertaken in three NHS hospital trusts in England; 1527 women who smoked at the beginning of pregnancy were recruited. A series of self-help booklets was given to the women by a midwife at the earliest opportunity in antenatal care and also a booklet for partners, family members and friends. Further booklets were mailed directly to the women. The primary outcome was smoking cessation validated by cotinine measurement at the end of the second trimester of pregnancy. Smoking cessation rates were low: the cotinine validated rates were 18.8% (113/600) in the intervention group and 20.7% (144/695) in the normal group (difference 1.9%, 95% confidence intervals –3.5% to 7.3%). Pregnant women and midwives approved of the intervention, but the way in which it was delivered varied considerably. The self-help intervention was acceptable but ineffective when implemented during routine antenatal care.

Assigning participants at random reduces the risk of bias and increases the probability that any differences between the groups can be attributed to the treatment/intervention. Having a control group allows us to compare the treatment/intervention with alternative choices. However, sometimes when undertaking research, RCTs cannot be carried out for ethical reasons, i.e. if there is risk of harm. See: Chapter 5, Ethics & Research Governance. An example of this would be randomising low-risk women to have a Caesarean section or vaginal delivery when there is no medical or obstetric indication for operative intervention.

Cluster trials

These randomise interventions/treatments to groups of participants rather than to individual participants. So the unit of measurement is the cluster and not the individual. Usually there is a larger sample size and the analysis is more complex. Ideally, cluster trials are suited to test interventions such as a community-based health programme. See Box 1.23.

The importance of evidence-based practice

Midwives have a professional responsibility to keep themselves up to date with the best available evidence. In the past, midwifery care has been based on traditional and cultural practices. Research was not included in the midwifery curriculum until the 1980s. Midwives then began to develop skills that enabled them to read, apply, understand and undertake research activities. It is now accepted that midwifery care can no longer be based on ritual and

traditional practices and it must be supported by research evidence. An ethnographic study, however, that explored whether midwives are using research evidence to support clinical practice reported that the issues that impact on the integration of evidence into practice are complex and there are no straightforward answers (Richens, 2002).

The reality is that some traditional practices that have been handed down appear to have some value and some do not and it is about getting the balance right. An example of a practice that has been demonstrated to be harmful is the advice that was initially written by Dr Spock (an American paediatrician) in the book *Baby and Child Care* published in 1956. He advised that babies should be placed on their fronts when sleeping as there was a risk of aspiration of vomit and choking when babies are placed on their backs. In the 1970s it was common practice for premature babies to be placed in the prone position as it improved respiratory function in babies with respiratory distress and reduced vomiting in babies with gastro-oesophageal reflux. This influenced baby care practices on full-term healthy infants and babies were placed on their fronts in the postnatal wards. There was an increase in sudden infant death syndrome (SIDS) in the 1970s and 1980s; by reversing the advice, the 'back to sleep' initiative led to a dramatic decline in SIDS in the 1990s (Evans *et al*., 2006). However, placing infants on their fronts, 'tummy time', is recommended when a baby is awake to offset motor skill delays associated with the 'back to sleep' position and plagiocephaly (flat head) (Majnemer & Barr, 2005).

These practices need to be evaluated and audit and research play an important part in assessing the benefits or not of the practices. Nevertheless, a multitude of professional and organisational constraints that prevent evidence-based practice (EBP) from being implemented has been acknowledged (Parahoo, 2009); that said the importance of EBP has increased and it is happening.

> An important aspect of evidence-based practice is the need to develop standardised measurable outcomes that allow the clinical practitioner to record the nature and severity of a given condition and then the effect of any care provided.
>
> Steen & Cooper, 1998, p. 6

A thorough, well designed systematic review and meta-analysis provides knowledge of the effectiveness of specific interventions/treatments but has limitations. Both quantitative and qualitative evidence need to be considered when implementing EBP. Other types of study designs are also needed to explore what is acceptable and structured reviews and meta-syntheses of qualitative evidence provide valuable information.

It has been recommended that students develop within a culture that encourages them to challenge clinical practice that is not supported by EBP (Royal College of Midwives (RCM), 2003; NMC, 2004b). However, there is evidence that what is taught during midwifery education and training does

not always correspond to what is happening in midwifery practice. Armstrong (2010) has reported that midwifery students have a preference towards EBP but challenging their midwifery mentors, if they were not practising EBP, would be difficult to undertake for fear of jeopardising their clinical assessments and career prospects. Interestingly, a qualitative study undertaken by Stapleton *et al*. (2002), who used non-participant observation and semi-structured interviews to explore the use of evidence-based leaflets on informed choice in maternity services, found that many midwives initially expressed positive views about the principles underpinning the leaflets. However, the leaflets were rarely used to maximum effect within practice settings. Some women expressed dissatisfaction when written information was used as an alternative to discussion. It was concluded that the way in which the leaflets were disseminated affected promotion of informed choice in maternity care.

Evidence-based guidelines

Evidence-based guidelines are systematically developed to provide guidance and recommendations to assist health professionals and service users to make decisions about the most effective healthcare to treat or prevent specific clinical conditions. Clinical guidelines provide recommendations for effective practice in the management and care of the health and well-being of the population. Throughout the world there are variations in health and maternal care. There are clinical guidelines available, but these are often based on a consensus of expert opinion, traditional practices or a non-systematic review of the published literature. The importance of evidence-based guidelines has increased over the last decade; they are less susceptible to bias in their conclusions and recommendations. National guidelines funded by various departments of health and professional bodies are developing a resource of evidence-based reviews and reports. For example, the National Institute for Health & Clinical Excellence (NICE) guidelines have been used to develop policies and standards for midwifery practice in England and Wales.

The National Institute for Health and Clinical Excellence (NICE)

NICE was set up in early 1999 as a Special Health Authority and is an independent organisation in England and Wales responsible for providing national guidance on the promotion of good health and the prevention and treatment of ill health. See: http://www.nice.org.uk/. Northern Ireland also now utilises NICE guidelines to help make clinical decisions and the Guidelines and Audit Implementation Network (GAIN) has an important safety and quality improvement role in Health & Social Care Services. See http://www.gain-ni.org/.

NICE produces guidance in three areas of health:

- Public health – guidance on the promotion of good health and the prevention of ill health for those working in the NHS, local authorities and the wider public and voluntary sector.

- Health technologies – guidance on the use of new and existing medicines, treatments and procedures within the NHS.
- Clinical practice – guidance on the appropriate treatment and care of people with specific diseases and conditions within the NHS.

NICE guidance is developed using the expertise of the NHS and the wider healthcare community including service users (patients and carers), healthcare professionals, NHS staff, industry and the academic world. NICE categorises its guidance by health subject and date published.

NICE guidance aims are:

- To promote good health and prevent ill health.
- To produce guidance documents where a range of representatives have been involved and consulted, those being health and social care professionals, patients and the general public.
- To provide guidance based on the best evidence drawn from systematic reviews.
- To be transparent in the guidance development and use quality assessment tools to promote reliability and consistency.
- To weigh up the cost and benefits of treatments and care.
- To make recommendations based on the evidence.

Over a decade on and NICE is now internationally recognised for its excellence and the NICE model is being utilised in Europe (Busse & Worz, 2003). NICE International contributes to better health around the world through the more effective and equitable use of resources. It does this by providing advice on the use of evidence and social values in making clinical and policy decisions. In addition on-going evaluation and review of the implementation of NICE guidance documents is carried out to audit its effects on clinical practice by the Evaluation & Review of NICE Implementation Evidence (ERNIE). See http://www.nice.org.uk/usingguidance/evaluationandreviewofniceimplementationevidenceernie/. Box 1.24 gives an example of NICE clinical guidelines.

Box 1.24 An example of NICE clinical guidelines – CG62 Issued March 2008.

Antenatal care: routine care for the healthy pregnant woman

The advice in the NICE guideline covers the routine care that all healthy women can expect to receive during their pregnancy.

It does not specifically look at women who are pregnant with more than one baby, women with certain medical conditions or women who develop a health problem during their pregnancy.

See http://www.guidance.nice.org.uk/CG62.

The Scottish Intercollegiate Guidelines Network (SIGN)

In Scotland, the Scottish Intercollegiate Guidelines Network (SIGN) was formed in 1993. SIGN develops evidence-based clinical practice guidelines for the NHS in Scotland. SIGN guidelines are developed from evidence gathered by systematic reviews and are designed to help bridge the theory–practice gap. The implementation of new knowledge into practice is the main objective of SIGN as this will reduce variations in practice and improve patient outcomes.

SIGN guidelines are developed by multidisciplinary working groups with professional and public representatives. Each guideline is based on the critical appraisal of the most up-to-date evidence. Evidence is identified, selected and evaluated according to a defined methodology. The guideline recommendations are graded according to the strength of the evidence. The ABCD grading score was developed from the original US Agency for Health Care Policy and Research approach to grading in its guidelines. (Evolved to become the Agency of Healthcare Research and Quality, AHRQ). SIGN guidelines, therefore, are based on a systematic review of the evidence, undertaken by guideline development groups which are supported by an executive.

SIGN guidelines are developed based on three core principles:

- Development is carried out by multidisciplinary, nationally representative groups.
- A systematic review is conducted to identify and critically appraise the evidence.
- Recommendations are explicitly linked to the supporting evidence.

For further information see http://www.sign.ac.uk/about/index.html.

Since 1 January 2005 SIGN has been part of NHS Quality Improvement Scotland (NHS QIS). NHS QIS is a special health board that advises, supports and assesses Scottish NHS boards to help improve the quality of healthcare which focuses broadly on safety, quality and health issues. There is a specific guidance on health improvement for maternal and child health and in March 2009, NHS QIS published the normal maternity care pathway which is based on the philosophy that pregnancy and childbirth are normal processes and unnecessary intervention should be avoided. The pathway supports the need to provide expectant mothers and their families with the most up-to-date evidence-based information. It recommends that a midwife should be the lead professional for healthy women with uncomplicated pregnancies. For further information see http://www.nhsqis.org/nhsqis/5205.141.1220.html.

Institute for Quality Assurance (IQA) Health and Social Care

IQA Health and Social Care has been established to bring together health professions and organisations that have an interest in continuously improving the quality of health and social care in the United Kingdom. The overall aim is to promote measurable and continuous improvement in the quality of

health and social care for the benefit of the general public. It has strong links with NICE and the National Patient Safety Agency (NPSA).

The National Patient Safety Agency (NPSA)
In the UK, the NPSA leads and contributes to improved, safe patient care by informing, supporting and influencing the health sector. It commissions and monitors the Confidential Enquiry into Maternal and Child Health (CEMACH) which has now become Confidential Enquiry into Maternal and Child Enquiries (CMACE). See http://www.npsa.nhs.uk/.

Confidential Enquiry into Maternal and Child Enquiries (CMACE)
The overall aim of the Confidential Enquiry into Maternal and Child Enquiries (CMACE) is to improve the health of mothers, babies and children by carrying out confidential enquiries and related work. It has an important role in disseminating the findings and making recommendations.

An example: results from a survey on NHS maternity provision for obese women and guidelines on the Management of Obesity in Pregnancy (CMACE-RCOG, 2010).

See http://www.cmace.org.uk/.

The Agency of Healthcare Research and Quality (AHRQ)
AHRQ is funded by the US Department of Health and Human Services to support health services' research initiatives that aim to improve the quality of healthcare in America. AHRQ's mission is '*to improve the quality, safety, efficiency, effectiveness, and cost-effectiveness of health care for all Americans.*' For further information see http://www.ahrq.gov/.

The US Preventive Services Task Force (USPSTF) is sponsored by the AHRQ to conduct thorough independent reviews of the scientific evidence for the effectiveness of a wide range of clinical preventive services and interventions. Twelve Evidence-based Practice Centers (EPCs) have been established to work collaboratively with the AHRQ and USPSTF to develop evidence reports and technology assessments. Five-year contracts are awarded to institutions in the United States and Canada to serve as EPCs.

There is a specific Women's Health section and a Maternal Health and Pregnancy category (under clinical topics); an example report is The Use of Episiotomy in Obstetrical Care: A Systematic Review. This report provides the best available evidence on episiotomy use and concludes there are no health benefits from episiotomy. The full report can be downloaded as a PDF file from http://www.ahrq.gov/clinic/tp/epistp.htm#Report.

There is also a 'Consumer Materials' section which provides the evidence in lay person language, What you need to know about episiotomy…

> Research shows that routine use of episiotomies (surgical cuts in the area between the vagina and anus) does not keep the mother's skin from tearing during birth.

> It does not speed up a normal birth. It does not help avoid the bladder control problems women sometimes get after having a baby.

The consumer report can be downloaded from http://www.ahrq.gov/consumer/episiotomy.htm.

Evidence-Based Maternity Care: What It Is and What It Can Achieve

A very detailed report by Sakala and Corry and co-published by Childbirth Connection, the Reforming States Group, and the Milbank Memorial Fund (2008) entitled *Evidence-Based Maternity Care: What It Is and What It Can Achieve* gives in-depth information about current maternity care in the US healthcare system. The report summarises results of systematic reviews that could be used to improve maternity care and identifies barriers to the use of evidence-based maternity care. It offers policy recommendations and other strategies that could lead to wider implementation of evidenced-based maternity care in the US.

For further information visit http://www.milbank.org/reports/0809MaternityCare/0809MaternityCare.html#executive.

National Antenatal Guidelines – Australia

The Australian government's Department of Health and Ageing works in collaboration with the National Health and Medical Research Council (NHMRC) to support health research in Australia. Clinical guidelines and health information leaflets based on the best available evidence are produced.

For Maternal and Infant Health see http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-maternal-index.

Presently, National Evidence-Based Antenatal Care Guidelines are being developed. A collaboration of state and territory governments and the NHMRC with funding from the Australian Health Ministers' Advisory Council is supporting this work. The Antenatal Guidelines will be based upon the best available evidence to assist in the promotion of national standardisation of antenatal care and will include flexibility to meet individual needs to improve maternal and infant health outcomes. See http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-antenatal-care-index.

Irish Society for Quality and Safety in Healthcare (ISQSH)

The ISQSH is a not-for-profit, charitable, non-governmental organisation whose overall aim is to improve the quality and safety of healthcare; it has set objectives to support the development of health professionals through professional education, training and research. In addition, it aims to provide a network for those working in or interested in healthcare quality. The society is governed by a multidisciplinary elected council and has strong collaborative links with a number of national and international partners including the

European and International Societies for Quality in Healthcare and the European Pathways Association. See http://www.isqsh.ie/.

European Society for Quality in Health Care (ESQH)
ESQH is a not-for-profit organisation dedicated to the improvement of quality in healthcare in Europe. Twenty national societies for quality in healthcare are members of this society, these include: Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy Lithuania, Luxembourg, The Netherlands, Norway, Poland, Portugal, Spain, Sweden, Turkey, United Kingdom and Egypt. See http://www.esqh.net/newsfolder_view?portal_status_title=ESQH+NEWS.

Summary

This first chapter has covered the general principles of research and given an insight into the types of knowledge, the research process, the difference between audit and research, the importance of the research question, the approaches that can be undertaken, the differences between these and the importance of applying evidence to midwifery care. Midwifery research has developed over the last few decades. The midwifery examples included in this chapter are only the tip of the iceberg and there is an ever increasing number of midwives and students developing research skills to undertake research activities. These examples demonstrate how both qualitative and quantitative research have been used to gather evidence to enhance midwifery care and practice. The different research methods that can be used to answer a specific research question have been introduced and the next chapters in this book will build upon this introduction to research.

In summary, this introductory chapter has set the scene; midwives and students should now be able to recognise different types of knowledge, know the difference between audit and research, be able to distinguish between qualitative and quantitative research approaches, will have gained knowledge and an understanding of different research methods and have an understanding of the importance of evidence-based practice. Service user involvement is considered good practice in all stages of research and this chapter highlights the importance of listening to women and their families; their ideas and views give an insight into what needs to be researched and how to conduct the research. Working in partnership with women and their families makes a difference to research outcomes and ultimately midwifery care and practice. It is now accepted that midwifery care can no longer be based on ritual and traditional practices and it must be supported by research evidence. Midwives have a professional responsibility to keep themselves up to date with the best available evidence. The next chapter gives an insight into how to perform this task.