

Demystifying nursing research terminology: Part 2

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Abstract

Aim To provide an explanation of the research methodologies and strategies available.

Background There are numerous research methodologies and strategies. The literature is ambiguous in relation to research terminology and this often leads to confusion about which methodology or strategy to adopt.

Data sources A review of the most up-to-date literature.

Discussion The most commonly adopted methodologies and strategies are discussed.

Conclusion Part 1 (Welford *et al* 2011) of this two-part paper explained the research paradigms and the rationales for choosing particular paradigms. Part 2 provides an explanation of the methodologies and strategies available to the researcher.

Implications for practice/research This paper will be particularly useful for novice researchers or doctoral students.

Keywords Paradigms, research strategies and methodologies, nursing research

Introduction

NURSE RESEARCHERS have a host of research paradigms, methodologies and strategies at their fingertips. There are more approaches being added to this mixed bag as research evolves. One of the first requirements of undertaking research is to establish which paradigm and subsequently which methodology or strategy can best answer the research question. This can be daunting for the novice researcher because there are many conflicting terminologies and definitions of approaches published.

Parts 1 and 2 of this paper offer an overview of the main approaches used in nursing research. They aim to contribute to a clearer understanding of the main approaches used in nursing research and thus remove some of the confusion and ambiguity which novice researchers may face.

Methodologies and strategies

The main research methodologies and strategies can mostly be classified as qualitative or quantitative. Morse and Field (1996) stated that qualitative

research constructs theory and quantitative research tests it. Denzin and Lincoln (1994) added that qualitative research stresses the socially constructed nature of reality, the relationship between the researcher and what is being studied, and the situational constraints that shape inquiry, while quantitative research emphasises the measurement and analysis of causal relationships between variables, not processes.

There are many methodologies and strategies that are considered qualitative and many others that are regarded as quantitative. The most commonly used approaches will be discussed.

Qualitative research

The goal of qualitative research is to yield rich, in-depth descriptions of phenomena. Qualitative inquiry is a process of documentation and description. It identifies patterns, concepts and the relationships between concepts, and creates theoretical explanations that explain reality (Morse and Field 1996). Qualitative research is inductive – inductive theory is directed towards bringing

knowledge into view. It is also generally descriptive, naming phenomena and positioning relationships. It is frequently conducted in the naturalistic setting and considers context as parts of the phenomena. The qualitative researcher's goal is to identify patterns or commonalities by inference from the examination of specific instances and events (Morse and Field 1996).

According to Polit *et al* (2001), qualitative research is flexible. It typically involves a merging of various data collection strategies or methods, tends to be holistic and often requires the researcher to become intensely involved and remain in the field for long periods of time. Burns and Grove (2001) added that there is no single reality in qualitative research, that reality changes over time and that meaning is contextual and situational. Qualitative research involves several phases, which include orientation and overview of the phenomenon of interest, a focused exploration of the phenomenon and confirmation that the findings are trustworthy, which then leads to closure (Polit *et al* 2001).

The following qualitative methodologies are the most frequently adopted in nursing research and their applications are illustrated in Table 1.

Ethnography

Ethnography is the study of people or cultures. Commonly used by social anthropologists, it requires the researcher to spend considerable time in the field and relies heavily on the analysis of field notes and participant observation (Patton 2002). Prospective ethnographers should be familiar with its three general features:

- It studies people in their natural settings.
- It is holistic and accepts the complexity of social organisations and order.
- It recognises culture, which enables the understanding of group identity and group regulation (Barton 2008).

Denzin and Lincoln (1994) stated that ethnographic approaches have been adopted in numerous disciplines and applied fields, such as social and cultural anthropology, sociology, human geography and education.

According to Patton (2002), ethnographic inquiry takes as its central and guiding assumption that any group of people interacting for a period will

evolve a culture. Creswell (2003) supported this by stating that ethnography directs the researcher to study an intact cultural group in a natural setting over a prolonged period by collecting primarily observational data and by using field notes and interviews. It aims to understand from the point of view of those involved rather than explaining from the outsider's point of view (Denscombe 2007). Researchers must acknowledge the role of the 'self' in ethnographic research and must present accounts of their beliefs, interests, experiences and qualifications in relation to the topic being researched (Denzin and Lincoln 1994).

Phenomenology

Phenomenology is a strategy of inquiry in which the researcher identifies the essence of human experiences about a phenomenon as described by participants. It aims to understand the 'lived experience' (Heidegger 1927, Moustakas 1994). It does not use scientific measurements but takes subjective, descriptive approaches instead. Rather than providing an understanding of the cause of something, it tries to provide a description of how things are experienced first hand.

There are two main approaches to phenomenology presented in the literature. Heidegger (1927) developed the phenomenological approach known as 'hermeneutics', meaning interpretation. He advocated 'bracketing' of researchers' experiences: in other words, researchers acknowledge their beliefs and experiences that may influence the research and 'bracket' them to keep them separate from the research findings.

Husserl (1913) then developed a phenomenology whereby researchers bring their understanding and experiences to the research process. Husserl believed that the relationship between perception and its objects was not passive and that human consciousness actively constitutes the objects of experience. He also believed that people describe things and experience them through their senses and that we can only know what we experience (Patton 2002). All experiences are understood by our senses but we must then describe and interpret those experiences (Husserl 1913).

According to Patton (2002), phenomenology can be a philosophy, an inquiry paradigm, an interpretive theory, a social science, an analytical perspective, an orientation, a major qualitative tradition or a research methods framework. These varying approaches share a focus on exploring how human beings make sense of experience and transform it into consciousness, individually and as shared meaning.

Qualitative research tends to be holistic and often requires the researcher to become intensely involved

Table 1 The most frequently adopted methodologies and their application to nursing research

Research question	Paradigm/ theoretical perspective	Ontology	Epistemology	Methodology	Methods
What is the truth? What is a plausible explanation? What can we establish with certainty?	Positivism.	'Real' ordered and regular world.	Objective/dualist.	Experimental, manipulative, Scientific, verification of hypotheses.	Quantitative, such as experiments and surveys. Strong focus on reliability and validity.
What causes or influences outcomes?	Post-positivism.	Reality can never been fully known.	Objective.	Measurement of objective reality. Testing hypotheses.	Numerical observations. Experiments, surveys, and so on.
How have people in this setting constructed reality? What are the consequences?	Constructionism.	Local and specific constructed realities. Sociological. The human world. Emancipatory. Relativity.	Subjective.	Action research, case study, mixed methods.	Qualitative and quantitative approaches such as interviews, observations and questionnaires. Triangulation, reflection, intervention.
How do people cope, deal with or describe their situations?	Pragmatism.	Practical world/situational responsiveness.	Subjective/practical.	Different methods are appropriate for different situations – mixed methods.	Qualitative and quantitative approaches such as interviews, observations and questionnaires.
What is the culture of this group of people?	Interpretivism.	People and culture.	Subjective.	Ethnography case study.	Participant observation and field notes.
What is the meaning of the lived experience of this phenomenon for this group of people?	Interpretivism/pragmatism.	The lived experience.	Objective/subjective.	Phenomenology.	In-depth interviews. Narratives.
What can participants reveal to generate a theory?	Interpretivism.	Open to new ideas – no fixed assumptions.	Objective/pragmatic.	Grounded theory.	In-depth and open interviews.
How can understanding and meaning from multiple perspectives explain an experience?	Interpretivism/constructionism.	Individuals attach meaning.	Multiple perspectives.	Case study.	Multiple such as interviews, observations and questionnaires.

Creswell (2003) stated that phenomenology requires the researcher to identify the 'essence' of human experiences concerning a phenomenon. This 'essence' is described by the participants. He adds that this understanding of the 'essence' of this 'lived experience' means that phenomenology is a strategy and a philosophy. Data collection methods for this strategy usually include in-depth interviews with people who have directly experienced the phenomenon of interest - in other words, they have the 'lived experience' (Patton 2002).

Grounded theory

Grounded theory is pragmatic and useful in qualitative, exploratory, small-scale and humanistic research. It is a strategy of inquiry in which the researcher derives a general, abstract theory of a process, action or interaction grounded in the views of participants (Glaser and Strauss 1967, Strauss and Corbin 1998). It expects the researcher to start the research without any fixed ideas about the nature of what is about to be investigated or how it operates. Some approaches to grounded theory even forgo conducting a literature review before the start of research (Charmaz 2000). Strauss and Corbin (1998) also stated that grounded theory is a general methodology for developing theory that is grounded in data that have been systematically gathered and analysed. The theory evolves during the research. Researchers may also use theory from previous research to elaborate that theory further.

Grounded theory uses the constant comparative method, compares research sites, undertakes theoretical sampling and additional fieldwork and tests emerging concepts to build and connect theory (Patton 2002). Creswell (2003) stated that grounded theory requires the researcher to attempt to derive a general, abstract theory of a process, action or interaction grounded in the participants' views. Data collection methods will most likely be less structured: for example, interviews will use open questioning rather than semi-structured interviewing (Strauss and Corbin 1998).

Mixed methods

A 'new movement' research technique, mixed methods combines alternative approaches in a single research project (Denscombe 2007). It was considered by Johnson and Onwuegbuzie (2004) as the third wave or third research movement but may have originated in 1959 according to Creswell (2003). It recognises that all methods have limitations and that by mixing methods, the various limitations can be neutralised: 'A mixed methods approach is one in which the researcher tends to base knowledge

claims on pragmatic grounds. It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand the research question' (Creswell 2003).

The mixed methods logic of inquiry includes the use of induction, deduction and abduction. It is considered pragmatic and focuses on the practical outcomes and 'what works'.

The key issues in mixed methods research include:

- The order: in which order are the methods used.
- Timing: at which point are the methods changed or combined?
- Proportion and priority: which methods are seen as dominant?
- Comparison and contrast: are the methods similar or different?
- Use and benefit: for what purpose are the alternative approaches combined?

Mixed methods requires the researcher to have a range of skills and knowledge for data collection and analysis, which may use qualitative and quantitative approaches. Johnson and Onwuegbuzie (2004) stated that the goal of mixed methods research is not to replace either qualitative or quantitative approaches but rather to draw strengths from and minimise the weaknesses of both.

Action research

According to Greenwood and Levin (1998), there are many different types of action research. Generally speaking, action research (AR) is social research carried out by a team comprising an action researcher and members of an organisation or community seeking to improve their situation. It promotes broad participation in the research process and supports action for problem solving. The researcher and the stakeholders together define the problems to be examined, co-generate relevant knowledge about them, learn and execute social research techniques, take actions and interpret the results of actions based on what they have learned.

Reason and Bradbury (2008) defined AR as a 'participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities'.

AR advocates that people accumulate, organise and use complex knowledge and experience constantly in everyday life. It is thus a process that engages with problems and learning to create a change. AR is a form of inquiry that enables

practitioners everywhere to investigate and evaluate their work by asking, 'What am I doing? What do I need to improve? How do I improve it?' The purpose of all research is to generate knowledge and AR generates a practical type of knowledge. As a result, it is coming to be seen as methodology for real-world social change (Greenwood and Levin 1998).

Case study

The essence of a case study is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented and with what results (Schramm 1971). First, the case study can explain the presumed causal links in real-life interventions that are too complex for other research methods. Second, it can describe an intervention and the real-life context in which it occurred. Third, it can illustrate certain topics in an evaluation. Finally, it can enlighten a situation in which an intervention is being evaluated (Schramm 1971).

According to Yin (2009), case studies provide a systematic way of looking at events, collecting data, analysing information and reporting the results. As a result, the researcher may gain a sharpened understanding of why the instance happened as it did and what future research might look at more extensively.

The contextual inclusiveness makes the case study unique among research strategies. Zucker (2001) identified case study research for nurses as a method that centralises the patient in the process. Gangeness and Yurkovich (2006) stated that case study research supports community engagement, empowers minorities and uses multiple data sources, increasing comprehensiveness and rigour. Yin (2009) also explained that case study research can exist as either a single case or multiple cases.

Gerring (2007) defined case study research by explaining that a case connotes a spatially delimited phenomenon (a unit) observed at a single point in time or over a period of time. A case may be created out of any phenomenon as long as it has identifiable boundaries and comprises the primary object of an inference as long as the case comprises the primary object of an inference.

According to Yin (2009), a case study must have five components: the research question, its propositions, its unit(s) of analysis, a determination of how the data are linked to the propositions and criteria to interpret the findings.

Yin (2009) also explained that multiple data collection methods can be used, including interviews, observations and documentary analysis, and that method and analysis can occur simultaneously in

Experimental designs are aimed at providing the greatest amount of control possible to examine causality

case study research. Specifically, data collection and analysis occur as an iterative process, wherein the researcher moves from the literature to the field data and back to the literature again.

Stake (1995) highlighted the importance of the description of contexts in case studies. Schatzman and Strauss (1973) suggested that keeping journals or logs helps to track methodological, observational and theoretical field notes during data collection in case studies.

Quantitative research

According to Polit *et al* (2001), quantitative research is divided into five dimensions, which include decisions relating to the control of independent variables, the type of group comparisons, the number of data collection points, the occurrence of independent and dependent variables, and the research setting. Burns and Grove (2001) described four types of quantitative research - descriptive, correlational, quasi-experimental and experimental - while Polit *et al* (2001) described three categories of quantitative research: experimental, time specific and types. However, the authors further explained that quantitative approaches include experiments, quasi-experiments, non-experiments, cross-sectional studies, longitudinal studies, surveys, evaluations and outcomes measures. Their textbook presents the most commonly adopted research approaches and describes them concisely.

Johnson and Onwuegbuzie (2004) explained that quantitative research is a form of social science inquiry and that it should be objective, time-independent and context-free in its generalisations. It should eliminate researcher biases, require the researcher to remain emotionally detached and uninvolved with the objects of study, and should test or empirically justify the stated hypotheses.

Rodriguez and Kotarba (2009) defined quantitative research as that which uses measurements as data and produces computations as outcomes. Furthermore, they explained that quantitative research differs from qualitative research in its philosophical underpinnings and consequently the methods used produce different knowledge. This is achieved by posing different questions to those asked in qualitative research and then making different epistemological and ontological assumptions as compared with those made in qualitative research.

'Through control, the researcher can reduce the influence or confounding effect of extraneous variables on research variables'

Burns and Grove (2001) stated that control of possible research variables is central to quantitative research: 'Through control, the researcher can reduce the influence or confounding effect of extraneous variables on the research variables.'

In other words, quantitative researchers have a clear, strict plan before starting research to determine how research will proceed.

Table 1 presents the most frequently adopted quantitative methodologies and their application to nursing research.

Experimental research

There are three tenets of experimental research: control, manipulation and randomisation (Bailey 1997). Manipulation involves the researcher doing something to the participants in the study, control involves using a control group – similar to the experimental group but separated from the phenomenon being investigated – and randomisation involves assigning participants to control or experimental groups randomly.

According to Burns and Grove (2001), the purpose of experimental research is to examine cause-and-effect relationships between independent and dependent variables in a highly controlled environment. Creswell (2003) explained that experimental research uses a power analysis to identify the appropriate sample size and this calculation includes a consideration of the level of statistical significance for the experiment, the amount of power (high, medium or low) for the statistical test of the null hypothesis, and the effect size or the expected differences in the means between the control and experimental groups expressed in standard deviation units.

Polit *et al* (2001) also stated that the experimental researcher is an active agent rather than a passive observer. Experimental designs are aimed at providing the greatest amount of control possible to examine causality (Burns and Grove 2001).

The classic experimental design has two participant groups. One receives the experimental treatment and one receives no treatment (known as the placebo). Pre-test scores are gathered. The researcher controls the treatment. The dependent variable is measured twice, once before and once after the manipulation of the independent variable.

The independent and the dependent variables are conceptually linked.

Correlational research

Correlational research examines the linear relationship between two or more variables and determines the type (positive or negative) and degree (strength) of the relationship (Burns and Grove 2001). Polit *et al* (2001) stated that this is a form of non-experimental research. Fitzgerald *et al* (2004) added that correlational research can be conducted for either predictive or explanatory purposes. Predictive studies gather data on one or more predictor variables and on one criterion variable that is hypothesised to occur after the predictor variable. Explanatory studies make use of theoretically chosen predictor variables that are hypothesised to account for the variance in the criterion variable. Correlational studies assess the strength of relationships as they occur or have occurred without experimental manipulation. Based on the observed relationships, statistical significance tests are then applied to determine the predictive or explanatory power of those relationships being studied.

Polit *et al* (2001) explained that correlational research can be retrospective, prospective or descriptive. Retrospective correlational research involves the investigator focusing on a presently occurring phenomenon and linking it with the past. The investigator aims to identify antecedent factors. In prospective correlational research, the investigator starts with presumed cause and then goes forward to the presumed effect.

Descriptive correlational research observes, describes and documents the relationship among variables. Correlational research is further explained by Fitzgerald *et al* (2004) as that which uses terms such as 'predictor' and 'criterion' instead of 'independent' and 'dependent', and these terms are used to discuss the variables.

Survey

According to Creswell (2003), a survey provides numerical description of trends, attitudes or opinions of a population by studying a sample of the research population. It involves pre-determining the design, population and sample, choice of instrumentation, identification of variables, and approach to data analysis. Burns and Grove (2001) stated that surveys are also non-experimental and use questionnaires or structured interviews to collect data about the identified population. Coughlan *et al* (2009) supported this and offered that survey research is a non-experimental approach that gathers information about the

incidence and distribution of, and the relationships that exist between, variables in a pre-determined population. They added that surveys use total populations and samples of the population to gather the required data.

Survey research can be descriptive, longitudinal, or correlational and comparative (Coughlan *et al* 2009). Descriptive survey research includes gathering data related to attitudes, behaviours and incidence of events. Longitudinal surveys administer the survey a number of times over the research period and correlational surveys study and compare the relationships between variables.

Polit and Tatano Beck (2008) stated that self-administered questionnaires are the backbone of survey research but that response rates can be unpredictable. Babbie (1990) argued that a 50 per cent response rate is acceptable and a 70 per cent response rate is desirable. Coughlan *et al* (2009) stated that a further limitation of this approach is that the required respondent may not have completed the questionnaire.

The survey results are presented through statistics – which may be descriptive or inferential. Descriptive statistics use frequency distributions,

central tendency and variability to describe the research variable, while inferential statistics use either parametric or non-parametric tests to seek relationships between variables, and this is used to predict outcomes.

Conclusion

This paper has discussed the various methodologies and strategies available to the researcher subsequent to having established the research paradigm. These are not exhaustive lists but rather an overview of the main approaches that tend to be adopted by the nurse researcher and which are summarised in Table 1. The two papers have collectively aimed to demystify the sometimes confusing and conflicting terminologies used in nursing research.

A researcher's world view (paradigm) shapes the research proposal and guides the choice of strategy or methodology used which in turn enable sound scientific research.

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Conflict of interest
None declared

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