

INVITED REVIEW

**Qualitative research in nutrition and dietetics:
data collection issues**

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Abstract

The wide scope of qualitative enquiry presents the researcher with a number of choices regarding data collection and sampling. Selecting data collection and sampling techniques can therefore be somewhat daunting, particularly because, often, there is no single, universally accepted 'correct' option. Appropriate research methods are, however, crucial to ensure high-quality research. This review, the second in the series, provides an overview of the principal techniques of data collection and sampling that may be used for qualitative research in nutrition and dietetics. In addition, it describes a process for choosing appropriate data collection and sampling methods that considers the extent to which they provide data that answers the research question(s) and are compatible with the philosophical assumptions about ontology, epistemology and methodology that underpin the overall design of a study. Finally, it discusses the central role that the researcher plays in qualitative data collection and encourages researchers to acknowledge and reflect upon their impact on the data. Other reviews in this series provide a model for embarking on a qualitative research project in nutrition and dietetics, an overview of the principal techniques of data analysis and quality assessment of this kind of research, and some practical advice relevant to nutrition and dietetics, along with glossaries of key terms.

Introduction

Qualitative enquiry is a large, diverse and evolving field (Swift & Tischler, 2010) and, as such, offers the researcher a wide range of different techniques to collect data. Choosing data collection and sampling methods for a qualitative research study can therefore be somewhat overwhelming, particularly because, often, there is often no single, universally accepted 'correct' option. Appropriate research methods are, however, crucial to ensure high-quality research (Carter & Little, 2007; Yardley, 2006).

This review, the second in the series, aims to provide an overview of the principal techniques of data collection and sampling that may be used for qualitative research in nutrition and dietetics, and to offer some

practical advice on how to choose appropriate methods. It takes a detailed look at the central role that the researcher plays in qualitative data collection and discusses issues particularly relevant to healthcare professionals, such as dietitians, who research their own patients. Other reviews in this series provide a model for embarking on a qualitative research project in nutrition and dietetics (Swift & Tischler, 2010) and an overview of the principal techniques of data analysis (Fade & Swift, 2010), and also introduce some of the key scientific debates around quality criteria that can be applied to qualitative research (Pilnick & Swift, 2010). In addition, all reviews in the series provide some practical advice for those wishing to engage with qualitative research in nutrition and dietetics, along with a glossary of key terms.

What techniques are available for collecting qualitative data?

Interviews

Interviews are the most widely used technique of data collection in qualitative health research, which is perhaps unsurprising considering they are defined simply as

‘... a kind of conversation; a conversation with a purpose’ (Robson, 1993: 228)

Yet interviewing is a complex social process and there are many different types of interview that vary in the degree to which they are structured, the number of participants, and the way that they are administered (see Glossary) (Minichiello *et al.*, 2008; Patton, 2002; Robson, 2002).

In terms of structure, at one end of the continuum, there are unstructured in-depth interviews where the researcher introduces a theme or topic and then lets the interviewee develop his or her ideas. Although the researcher may guide the interview at certain points (e.g. to raise key topics of interest or to probe the participant to explain something in more depth), their main role is to listen. This kind of interview allows the experiences, meanings, values and priorities of participants to emerge with minimal interference on the part of the researcher but may be less useful for answering specific research questions. At the other end of the continuum, there are fully structured interviews comprising predefined questions administered in a preset order, often with a selection of predefined answers for the participant to choose from. Although unanticipated responses and concerns cannot be captured, more structured interviews allow greater standardisation and are often used in large scale survey research, such as opinion polls and large-scale government surveys. As the name suggests, semi-structured interviews fall in between these two extremes. As in structured interviews, the interviewer has a clear list of issues to be addressed and questions to be answered but question structure, phrasing and placement are flexible and the interviewer is also free to probe responses.

Interviews can be conducted on a one-to-one or group basis. The latter include techniques such as interviews with cohabiting couples, consensus panels and community interviews, group interviews and focus groups. Although focus groups have become popular in recent years, it is important to note that they are more than group interviews; the purpose is to utilise group dynamics to access people's own vocabulary and concerns, group norms and knowledge as well as the way in which these are generated in everyday life (Kitzinger, 1994; 1995). Proponents of interviews involving more than one participant argue that the verbal interaction within groups reveals a layer of meaning over and above what is gained

in individual interviews and that they take into account the fact that individuals do not make decisions or form their opinions in a social vacuum (e.g. Green *et al.*, 2003). Interviews involving more than one participant have been used to successfully in nutrition research (e.g. Mercado-Martinez & Ramos-Herrera, 2002; Gronhoj & Olander, 2007) but do require skill to moderate well.

Interviews can be administered in various ways such as face-to-face, over the telephone and even online. Face-to-face encounters are good for establishing rapport and also for capturing the body language of participants, although the impersonal nature of telephone or online interviews may facilitate access to participants in distant geographical locations or who struggle to reveal feelings and experiences (Evans *et al.*, 2007; Whitehead, 2007).

Much qualitative research tends to be cross-sectional and use single interviews with each participant. However, longitudinal study designs utilising multiple interviews over a period of time may also be useful (Flowers, 2008), particularly when exploring the complex and dynamic nature of sustained motivation (Beltman & Voet, 2007) or experiences of a condition or situation that changes over time (Murray *et al.*, 2002).

All interviews are interwoven with issues relating to ethics and the balance of power between the researcher and the researched (Hewitt, 2007). These issues are particularly salient for healthcare professionals, such as dietitians, who research their own patients. The ‘health-care-professional-as-researcher’ is uniquely placed because they are already immersed in the field and have important insights into patient issues (Gibbs *et al.*, 2007). However, they can add a significant power imbalance into the interview and raise difficulties for participants in how free they feel to be open and/or critical. Reventlow & Tulinius (2005) offer an interesting study of the ‘health-care-professional-as-researcher’, in this case a doctor moderating a focus group, and how this role is actively negotiated and influenced by the researcher's position. When conducting interviews, the safety and autonomy of both the researched and the researcher are paramount. Although research ethics committees should ensure that participants' safety and rights are guaranteed, it is equally important to assess and minimise any risks that might accrue to researchers (e.g. if they are working alone). Some useful guidelines on ensuring research safety have been produced by Craig *et al.* (2001).

The actual data generated by interviews, both individual and group, are words. Generally interviews are recorded and then transcribed to produce transcripts for analysis but they can also be videoed to capture nonverbal communication. Do not underestimate the amount of data that interviews can generate – usually at least thirty pages for an interview or discussion approximately 1 h in length.

Observations

Observations are used to capture peoples' actual behaviour and how this may vary with social context. Their strength is in capturing what participants actually do, rather than what they say they do, and for capturing routine behaviours, which by their very nature can be unconscious. As with interviews, there are different kinds of observational techniques and these too vary in the degree to which they are open or structured, as well as whether the observer participates and interacts with the people being observed (Hudelson, 1994; Robson, 2002). Participant observation is the classic method used by anthropologists, for whom the goal is a holistic description of a group of people and all aspects of their lives, culture and social organisation (i.e. an ethnography) (Malinowski, 1922). This may take years and is clearly impractical in the context of most applied research, although observational methods can offer rich insights; they were famously used by the anthropologist Douglas to study the structure and function of British meals (Douglas & Nicod, 1974; Douglas, 1975). Observations can offer insights into the impact of context on eating habits, for instance those of children (e.g. Ross, 1995) and have been used to study eating disorders (e.g. Stein *et al.*, 2006). Unstructured observations are extremely time-consuming to conduct and analyse because they happen in real time, so structured observations of, for example, predefined behaviours or events, are more frequently used in health research. Although covert observations have been used in the past, as in Rosenhan's (1973) famous study of institutionalisation, they are generally not considered ethical.

Texts and documents

The researcher might collect data from participants via solicited texts, such as diaries, or data might come from unsolicited texts, such as formal medical records, newspaper articles, research outputs, minutes of meetings, letters and reports. They can be analysed for content and the 'correctness' of that content, as in Basu & Hogard's (2008) analysis of newspaper reporting of nutrition research, or they can be analysed to examine how a particular issue is 'framed', as in Martens & Scott's (2006) analysis of the changing discourse of domestic hygiene in *Good Housekeeping* magazine.

Archived qualitative data

Funding bodies, such as the Economic and Social Research Council, encourage archiving of qualitative data for re-use (Henderson, 2007). This is considered to help exploit the data's full potential because working within different strate-

gies of inquiry will produce different findings (Wu & Volker, 2009). For example, Bishop (2007) has analysed two historical qualitative data sets held by UK Data Archive (<http://www.data-archive.ac.uk>) to explore the beliefs and practices from which current uses of convenience food may have emerged. Secondary data analysis is not, however, without its critics, and those interested in re-using existing qualitative datasets should carefully consider the implications of this approach (Dicks, 2007; Broom *et al.*, 2009).

Sampling and recruitment: who, what, when, where, how?

Research participants

In the vast majority of studies, it is simply not possible to collect data from every member of a particular population. An early step in designing a research study is therefore to decide who and how many people to recruit. Most quantitative research aims to empirically generalisable (i.e. tell us something about the characteristics of a population at large). They therefore aim to collect data from a sample drawn from the population that is both statistically representative and is large enough to minimise sampling error (Trochim, 2006). This is normally achieved via some form of probability sampling, whereby potential participants are selected at random from the population of interest. By contrast, most qualitative research aims to be theoretically generalisable rather than empirically generalisable (see Glossary) (Draper, 2004), and therefore does not require large or statistically representative samples. Despite this, an effective sampling strategy is just as important for qualitative research as it is for quantitative research.

Qualitative research mostly uses some type of purposive sampling to recruit relatively small numbers of participants. As the name suggests, purposive sampling requires that people are deliberately selected with an explicit purpose in mind, namely to address the research aim and because they are rich sources of data in relation to this (Marshall, 1996). They could therefore be selected on the basis of their personal characteristics (e.g. gender, socio-economic status, nutritional status), their experience of a specific event (e.g. participation in a cooking skills class), their behaviour (e.g. attendance at an appointment to test blood cholesterol) or their attitudes and beliefs. There are a number of different types of purposive sampling – Patton (2002) identifies 16 different types, including deviant case sampling, maximum variation sampling and typical case sampling. What characterises many of these is the degree to which they generate samples of people, events or places that are either similar or dissimilar in relation to a key aspect of the research question. Theoretical sampling is

rather different; it is driven by the goal of finding manifestations of particular theoretical constructs that emerge from early analysis (Coyne, 1997). Theoretical sampling originates from Grounded Theory and suggests that sampling should be continued until no new data or properties relating to the construct(s) of interest emerge; a situation referred to as *theoretical saturation* (Glaser, 1992). Convenience and snowball sampling are also used in qualitative research, although they are conceptually distinct in that they rely on chance or opportunity (e.g. the first person who comes into a clinic) or social networks to generate a sample. Although sometimes criticised for lacking intellectual credibility (e.g. Marshall, 1996), they can sometimes be the only practical option particularly when working with vulnerable and hard-to-reach populations.

One of the biggest challenges for qualitative researchers is sample size. Unfortunately, power calculations cannot be employed during protocol development to calculate what will be an adequate sample size. Instead, an adequate sample size is one that is large enough to answer the research question but not so large that the amount of data prohibits in-depth analyses (Sandelowski, 1995). As Patton (2002) notes, meaningful case studies can be conducted with a sample size of one, although nutrition and dietetics has yet to embrace this methodology and it is more usual to see sample sizes in double figures (e.g. Sobal, 2001). Generally, the broader the phenomenon under study, the larger the sample is required. Although the required size of the sample is something that will only become clear as the study progresses, research funding bodies and ethics committees may demand clarification before the study commences. Indicators of what might be adequate sample sizes could be those used in similar types of high-quality, published studies or evidence-based recommendations. For example, Guest *et al.* (2006) have demonstrated that theoretical saturation can be achieved within the first six interviews.

Having decided on the rationale for selecting particular people to include in the research, how to access and recruit participants next needs to be considered. In part, this will be related to the overall sampling strategy. If, for example, it has been decided to purposively select people who are users of a particular service or clinic, then there may be a sampling frame (i.e. a formal list of the eligible and accessible population) that can be used. For other studies, finding ways to actually identify and approach potential participants can be more difficult for a range of reasons, including language and literacy skills, feelings of alienation and suspicion, and time demands. Qualitative researchers therefore often have to work hard to be inclusive (e.g. Luck & Rose, 2007; Lawson *et al.*, 2008). As mentioned above, snowball sampling can be useful as can

working through 'gatekeepers' such as community leaders (Green & Thorogood, 2004).

Obtaining informed consent is a vital part of the recruitment process. This normally involves producing information sheets that fully describe the study and offering potential participants the opportunity to discuss their involvement with a member of research team. However, the need to explain the nature and purpose of a study fully may conflict with the researchers' desire not to lead participants to express certain, socially desirable view points. Organisations such as The Department of Health (2006) recommend payment to research participants as a way of acknowledging the value of their contributions and suggests that it does not influence the independence of their views. Others, however, suggest that paying participants should not be automatically regarded as unproblematic (Head, 2009), and that the impact of making such payments in qualitative research should be reflected upon during data interpretation (Cook & Nunkoosing, 2008; Head, 2009).

Texts and documents

Again, texts or documents can be sampled using either representative or purposive sampling strategies with the choice depending on the research question and, to some degree, the types of documents or texts that are being used (Green & Thorogood, 2004). For example, a sample of medical case notes could be randomly selected to analyse and describe a particular group of people's experiences. Alternatively, if conducting historical research or perhaps a policy analysis, some form of purposive sampling will be more appropriate. Ethical issues relating to access and confidentiality and the Data Protection Act will govern the identification and use of internal reports or documentation of some organisations, although the Freedom of Information Act could be used to gain access to and use of government documents.

Choosing the most appropriate method of data collection

Each data collection technique generates different kinds of data and provides different kinds of insights, so that the choice of method requires careful analysis of the research question and the type of information required to answer this (Hudelson, 1994). Unfortunately, this question tends to be answered the other way around; a phenomenon termed 'methods in search of a problem' (Robson, 2002). A useful guide is Robson's (2002) (modified) rules of thumb for selecting data collection techniques which are:

- To find out what people do in public use direct observations

- To find out what people do in private use interviews or questionnaires
- To find out what they think, feel and/or believe use interviews

In addition, many qualitative researchers work within particular strategies of inquiry which vary in the extent to which they promote the use of particular data collection methods or sampling techniques (Swift & Tischler, 2010). For example, Narrative Analysis is conducted on individual interview data or existing documents such as published memoirs, whereas Grounded Theory is compatible with individual interviews, focus groups, observation, diaries, and existing texts and documents (Willig, 2008). In terms of sampling, as mentioned previously, Grounded Theory promotes theoretical sampling (i.e. an iterative approach), whereby sampling continues aiming to explore findings from early data analysis (Coyne, 1997). By contrast, Interpretative Phenomenological Analysis can take an idiographic approach whereby individual cases are analysed separately and the results of each analysis integrated only in the later stages of the research (Willig, 2008).

Whether a researcher is working within a defined strategy of inquiry or not, all choices about research methods not only have to be appropriate for answering the research question(s), but also they must match the philosophical assumptions about ontology, epistemology and methodology that underpin the overall design of a study (see Glossary) (Swift & Tischler, 2010). To illustrate this, Swift & Tischler's (2010) worked example of how to developing a qualitative research strategy from the hypothetical research question 'What is the experience of obese adolescents who access adult weight management services?' is extended to include data collection issues (Table 1).

The central role of the researcher

In qualitative research, the principle tool of data collection is arguably the researcher. The qualitative researcher therefore needs to be reflexive; recognising their role in the research process via critical self-scrutiny (Mason, 2002). This should include trying to identify preconceived opinions or beliefs that may be held about the phenomenon or group of people that are being investigated and how these may influence what is seen, heard and reported. Reflexivity is recommended as a key strategy to minimise these effects and to enhance the credibility of qualitative research (Pilnick & Swift, 2010). The aim is to acknowledge the impact of the researcher's views and values that inevitably are brought to the research process, although the ways in which this is done are seldom made explicit (Bradbury-Jones, 2007). One strategy is to keep a reflexive diary (Bradbury-Jones, 2007), another is to

utilise an insider–outsider heuristic (Hellawell, 2006). As well as the impact of the researcher on the research process, the researcher may be negatively influenced by the research, particularly if the subject is of a sensitive or emotional nature (Malacrida, 2007).

Interviews can be seen as a form of *guided conversation* (Lofland & Lofland, 1995) and, as such, they require skills in social interaction. Healthcare professionals who have received training in communication skills and have experience of eliciting information from a range of clients may therefore be at an advantage compared to other novice qualitative researchers. The interviewer needs to be able to listen, remain engaged and interested, to suspend judgement, and to be able to probe participants to provide information in more depth without making them feel that they are being interrogated. Good interviewing also requires nonverbal skills, such as body language and so-called phatic conversational cues of the 'mmm' and 'oh really that's interesting' (Minichiello *et al.*, 2008). Interviews involving more than one participant can be particularly challenging because the researcher may have to deal with people who want to dominate the discussion, possible conflicts and differences of opinion, people who are shy or just everyone trying to talk at the same time (Krueger & Casey, 2000).

Question design: good questions equals good data

The degree to which questions will be formally worded and defined before the interview depends upon the level of structure that has been chosen as most appropriate. If unstructured interviews have been selected, the questions will not be predefined but an interview guide is still required (Lofland & Lofland, 1995; Robson, 2002). This should include how introductions will be made, how the interview will be opened and closed, as well as prompts or probes to elicit information more fully on certain issues (e.g. 'Can you tell me more about that?') and bring an interview back to the topic of interest if the participant significantly digresses (e.g. 'You talked about food before and that reminds me to ask you ...').

For semi-structured or structured interviews in which questions are predefined, the design and wording of questions is vital to operationalise the key concepts in the research question. This refers to the process of identifying and developing indicators that reflect the concepts in the research question. For example, taking pills could be considered to be an indicator of compliance with professional advice and which are reflected in data such as observational or verbal reports of pill-taking (Green & Thorogood, 2004). A general principle is that questions must make sense to the participants; if no account is taken of cultural

and social contexts, participants often re-interpret questions in ways that are meaningful or acceptable to them (Stone & Campbell, 1984). It is also important to avoid questions that in anyway lead people to give certain responses and to avoid ambiguity. Although some authors such as Holloway (1997) suggest that separate pilot studies (where some data collected is not used as part of the main study) are not necessary in qualitative studies, they do recognise that analysis of early data may improve later data collection and that, for the novice, it offers an opportunity to develop technique. Others consider separate pilots to

be particularly relevant for those who are not already immersed in the field (e.g. Gibbs *et al.*, 2007).

In addition to asking people questions, there are a variety of nonverbal techniques that can be used to stimulate discussion. These might include presenting participants with vignettes to consider and comment on, and tasks, such as pile sorts or free listing to identify how people categorise different objects/events. Participants (particularly those, such as children, who may find it difficult to express themselves verbally in a formal interview) can be asked to create visualisations such as paintings, collages,

Table 1 Developing a qualitative research strategy from a research question: an example from nutrition and dietetics (adapted from Swift & Tischler, 2010)

Research question	The starting point is the research question, which in this hypothetical example is ‘What is the experience of obese adolescents who access adult weight management services?’
Ontological position	The researcher, in this case, a National Health Service dietitian, might assume a relativist ontological position. This means that he/she accepts that the experience of obesity in this population is socially constructed (i.e. is influenced by factors such as the individual’s culture and family history). Other considerations would be the concerns and background of the researcher. In this case, the dietitian’s professional position and work context will impact on how the data are approached and analysed (e.g. the data may be analysed with a view to developing new services for the population of interest)
Epistemological position	In keeping with his/her relativist ontological position, the researcher might hold an epistemic position in which he/she does not attempt to produce objective findings but, instead, embraces subjectivity. He/she may view subjectivity as being crucial to this particular piece of research because it acknowledges that different individuals will experience the ‘same’ environment differently. For example, one participant may find adult services intimidating and the advice given irrelevant, whereas another participant might find such services self affirming because it validates his/her burgeoning status as an adult. Correspondingly, the researcher would reflect on factors that might influence the participants’ experience and the impact of the researcher’s own views and values, as outlined above
Methodological position	Because the researcher considers reality to be socially constructed and aims to produce subjective findings, he/she favours the process of inductive reasoning. Rather than setting up a series of hypotheses, the research is guided by an open-ended research question. In this way, the researcher does not make any predictions about the experiences of participants, instead he/she uses the data to generate explanations
Qualitative strategy of inquiry	The research question focuses on the examination of <i>experience</i> itself, which suggests that a phenomenological strategy of inquiry is appropriate. The philosophical branch of phenomenology (see Husserl) suggests that experience is separate from reality and is concerned with individual meanings and interpretations, the so-called <i>lifeworld</i> of an individual (Ashworth, 2008). An appropriate qualitative technique would therefore be Interpretative Phenomenological Analysis (IPA) (Fade, 2004; Smith <i>et al.</i> , 2009). IPA is rooted in phenomenology, that is, it is concerned with individuals’ lived experience and how they make sense of that experience. It adopts a double hermeneutic position, which means that it foregrounds the reflexive position of the researcher making sense of the participant’s experiences
Data collection and sampling methods	Individuals who would be rich sources of data in relation to this particular research question might be a homogenous sample of young people aged 12–18 years with a body mass index equivalent to $\geq 30\text{ kg m}^{-2}$ at age 18 years (Cole <i>et al.</i> , 2000) who attend an adult out-patient weight management clinic at a local hospital. Potential participants might therefore be identified on the basis of their age and body mass index from clinic records (i.e. purposively sampled), and invited to participate. As a result of the in-depth nature of the analysis undertaken in IPA, small sample sizes are appropriate; typically between three and six participants (Smith <i>et al.</i> , 2009). Furthermore, an appropriate method of data collection to answer the research question would be semi-structured individual interviews to explore how the study participants experience adult weight management services. Semi-structured interviews capture the participants’ own ‘stories’ and are therefore compatible with the researcher’s belief that the experience of obesity in this population is socially constructed and that different individuals will experience the ‘same’ environment differently. The detailed and complex data produced by semi-structure interviews is ideal to generate explanations (i.e. a methodology by which the research can proceed via inductive reasoning). Finally, semi-structured interviews are compatible with his/her chosen strategy of inquiry, namely IPA, because they allow participants to share their personal experience of the phenomenon under investigation without being directive (Willig, 2008), thereby helping to capture the participants’ <i>lifeworld</i> (Ashworth, 2008)

photographs and video diaries as part of the research process (Reavey & Johnson, 2007).

Conclusions

The wide scope of qualitative enquiry presents the researcher with a number of choices about data collection methods and sampling. The most common technique for

gathering data in qualitative health research are interviews, which can also vary in their degree of structure, the number of participants involved, the mode of delivery, and the number of interviews to be conducted with each participant. Other useful techniques include observations of behaviour, which can also vary in their level of structure and the extent to which the researcher participates and interacts with the people being observed, both

Glossary

Epistemology	The branch of philosophy concerned with the theory of knowledge (Carter & Little, 2007). Epistemic position refers to adherence to a particular idea about how researchers can produce knowledge
Ethnography	The classic method of anthropological research which emphasises the naturalistic observation of social phenomena in the field. It seeks to capture, interpret and explain how a group of people, organisation or community live, experience and make sense of their lives and their world. This term is also used to refer to the output of such research; e.g. <i>The Argonauts of the Western Pacific</i> by Malinowski (1922)
Focus group	A specific type of group interview that deliberately includes and uses group interaction to generate data
Generalisability	The extent to which research findings have meaning outside the research context (i.e. to what other groups, settings or activities can the results obtained be generalised?) <i>Empirical</i> generalisability refers to the extent to which research findings can be used to infer about the characteristics of a wider population (Mason, 2002). <i>Theoretical</i> generalisability refers to the extent to which research findings can be used to develop concepts, understand phenomena and theoretical propositions that are relevant to other settings and other groups of individuals (Draper, 2004)
Grounded theory	Derived from sociology and focuses on generating theory that explains the data (Dew, 2007)
Interview	One-to-one discussions which may be more or less structured with the goal of finding out how other people think, feel and experience their world. Qualitative interviews are intended to generate insights and new concepts rather than measure or evaluate existing ones. The main types used in qualitative research are structured, semi-structured and in-depth
Interpretative Phenomenological Analysis (IPA)	Rooted in phenomenology, IPA is concerned with individuals' lived experience and how they make sense of that experience. It adopts a double hermeneutic position which means that it foregrounds the reflexive position of the researcher making sense of the participant's experiences (Fade, 2004; Smith <i>et al.</i> , 2009)
Ontology	Relates to people's understanding of the nature of the world (Willig, 2008)
Narrative analysis	Uses people's life stories to investigate the ways in which people bring order and meaning to experience (Willig, 2008)
Methodology	Theories about how research should proceed (Carter & Little, 2007)
Population	In sampling, this refers to the wider group to whom generalisations or inference will be made (e.g. school children or pregnant women in a particular geographical location). A sample is drawn from this population
Probability sampling	Although there are many different kinds of probability sampling, they are all designed to generate samples that are statistically representative to enable empirical generalisations to be drawn from the study finding about the wider population and that have quantified levels of precision. Most often associated with quantitative research
Purposive (nonprobability) sampling	A sample is drawn not be representative in statistical terms, but because individual cases are rich in information relevant to the research question and its concepts. There are many different kinds that share the goal of generating theoretical generalisations or insights rather than empirical generalisations
Reflexivity	Consideration of the researcher's own role in the research process via critical self-scrutiny (Mason, 2002)
Relativism	Belief in a socially constructed reality. Relativism accepts that how people perceive their world and their thoughts about it are always influenced by social factors such as culture, history and language (Willig, 2008)
Research methods	Research action; the techniques for collecting and analysing data (Carter & Little, 2007)
Sampling frame	A list or map that identifies all or most of the units in the study population (e.g. the electoral roll or a list of general practitioner surgeries in particular area)
Strategies of inquiry	Provide the researcher with an overall strategy for formulating, articulating, analysing, and evaluating their methods (Carter & Little, 2007). Common strategies of inquiry in health research are Phenomenology, Grounded Theory, Discourse Analysis, Ethnography, Ethnomethodology and Action Research (Dew, 2007)
Study design	This refers to the overall strategy adopted in addressing the research question. It includes the units of analysis to be studied (e.g. children, hospitals, schools); the approach to be used in the selection of these units; the kinds of data collected (e.g. quantitative or qualitative); whether these data are collected cross-sectionally or longitudinally over time, and the approach to analysis and interpretation
Unit	In sampling, this refers to the specific entities (e.g. types of people or organisational contexts that are the object of enquiry and are part of a wider population)

solicited and unsolicited texts and documents, and re-using existing data. Although qualitative research mostly uses some type of purposive sampling to recruit relatively small numbers of participants, there is a wide range of different types from which the researcher must choose. Selecting data collection and sampling techniques can be somewhat daunting, but appropriate choices are crucial to ensure high-quality research. The advice presented here is that research methods should be selected on the basis that they: (i) provide data that answers the research question(s) and (ii) are compatible with the philosophical assumptions about ontology, epistemology and methodology that underpin the overall design of a study. In addition, it is recommended that researchers recognise and reflect upon their role in the research process, such as the impact of their data collection techniques and sampling strategies on the research findings.

Conflict of interests, source of funding and authorship

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