Clinical research 4: Qualitative data collection and analysis

Ruth Endacott RN, DipN(Lond), MA, PhD (Professor of Clinical Nursing) *

University of Plymouth, Faculty of Health and Social Work, Earl Richards Road North, Exeter EX2 6AS, United Kingdom
La Trobe University, PO Box 199, Bendigo, Victoria 3552, Australia

Summary  This six-part research series is aimed at clinicians who wish to develop research skills, or who have a particular clinical problem that they think could be addressed through research. The series aims to provide insight into the decisions that researchers make in the course of their work, and to also provide a foundation for decisions that nurses may make in applying the findings of a study to practice in their own Unit or Department. The series emphasise the practical issues encountered when undertaking research in critical care settings; readers are encouraged to source research methodology textbooks for more detailed guidance on specific aspects of the research process.

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Introduction

Qualitative research is often referred to as ‘real world’ research as it commonly involves undertaking observation and interviews in the location of the participants. There are two dominant paradigms in qualitative research: the interpretive paradigm (ethnography, phenomenology, grounded theory) and the critical paradigm (feminist or action research). The key features of these five are provided in Table 1. Qualitative description is a sixth approach that is becoming increasingly popular when none of these five is suited to the research study (Sandelowski, 2000); an example of this approach is seen in Europe and Tyni-Lenne (2004) study of the male experience of heart failure. It is increasingly common for qualitative and quantitative approaches to be used in the same study; useful examples are found in Evangelista et al. (2003) and Fitzsimmons et al. (2003). This paper focuses on the common elements of qualitative research and issues to be addressed in clinical qualitative research.
There are three central methods used in qualitative research: interview, observation and documentary analysis. Interviews are commonly semi-structured — open questions that are predetermined but allow the participant or researcher to diverge to pursue an idea in more detail — or in-depth/unstructured — one or two global questions allowing the interview to progress in the direction dictated by the participant. With this latter approach, subsequent questions tend to probe and seek clarification on details. Another approach for interviewing is the critical incident technique; this is used when the researcher seeks to focus on the participant’s memories of one (or more) specific incident.

Observation has been described as the ‘closest to a gold standard’ in qualitative research (Murphy and Dingwall, 1998) as it enables comparison between stated and actual actions and often identifies issues that neither the researcher or the ‘researched’ were overtly aware of. Observation can be carried out as exploratory work to identify themes for further exploration in a fuller study; alternatively observation and interviews can be undertaken simultaneously or in a sequential manner (for example Currey et al., 2003).

With the exception of historical research, documentary analysis is rarely used as the sole method of data collection. It will more commonly be used to add complementary data (e.g. the analysis of nursing records to identify differences between observed care and recorded care). The document being analysed will not have been recorded as research data hence three factors have to be explored: the context of the documentation, the purpose for which it was written and the circumstances under which it was written (for example, what is recorded? what is omitted? what is taken for granted?).

Data collection activities

There are a number of key activities common to qualitative data collection (Creswell, 1998, p. 110). Key issues in relation to critical care settings are addressed below.

Gaining access/achieving entrée

Prior to formal processes for access via the hospital R&D committee and ethics committees, permission must be obtained from the nurse manager. In addition, for observation studies, permission needs to be refreshed for each shift of observation, with the shift leader. A helpful tool has been developed by Scholes (1996) to assist in this process. Key information to be provided to the manager in seeking access is detailed at Table 2.

Three ethical principles underpin data collection: autonomy, anonymity/confidentiality and informed consent (Endacott, 2004). In critical care settings the latter poses particular dilemmas for researchers and ethics committees (Grap and Munro, 2003); for a lively debate about the impact of requiring patient consent on recruitment for a sepsis study, see Annane et al. (2004) and Lemaire (2004). A particular issue to address with documentary

Table 1  Key features of qualitative research methodologies (after Creswell, 1998; Hek et al., 2002)

<table>
<thead>
<tr>
<th>Focus</th>
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<tbody>
<tr>
<td>Ethnography</td>
<td>Understanding cultural rules</td>
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<tr>
<td></td>
<td>Observer role includes some participation in the situation</td>
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<td></td>
<td>Observation is a key data collection method, with informal and formal interviewing</td>
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<tr>
<td>Phenomenology</td>
<td>Exploring a phenomenon in depth</td>
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<td></td>
<td>May include ‘lived experience’</td>
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<td>Grounded theory</td>
<td>Developing theory inductively from the data</td>
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<td></td>
<td>Relies on iterative process of data collection and data analysis</td>
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<tr>
<td></td>
<td>Generating hypotheses which are then tested through data collection</td>
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<tr>
<td>Action research</td>
<td>Attempts to bring about change in practice during the research</td>
</tr>
<tr>
<td></td>
<td>Attempts to influence the real world through a spiral process of change and evaluation</td>
</tr>
<tr>
<td>Feminist research</td>
<td>Non-threatening and non-hierarchical relationship between researcher and participants</td>
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<tr>
<td></td>
<td>Two-fold goal:</td>
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<tr>
<td></td>
<td>• To raise consciousness of women’s issues</td>
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<tr>
<td></td>
<td>• To empower women as a result of the research</td>
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analysis is the steps necessary to anonymise records, for example removal of staff names/signatures. Access to photocopying facilities is a practical consideration, particularly when the document is part of patient records for the current care episode. Ethics committees commonly require both of these processes to be made explicit.

Identifying the sample

Sampling in qualitative studies is based on theory and decisions about who to sample will either be made prior to data collection (purposive sampling) or during data collection, as the theory emerges (theoretical sampling). A useful example of theoretical sampling is found in Ball and Cox (2003). Sample size in qualitative research is based on saturation, or ceasing data collection when data categories have been exhausted. Theoretical sampling and sampling based on saturation can raise issues for ethics committees. An indication of the ‘population’ of participants who will be sampled (e.g. junior or senior nursing staff) with likely numbers should be given. If the emerging theory requires a researcher to approach a different group of participants, for example relatives, the ethics approval will need to reflect this change.

Theoretical (or theory-based) sampling is a requirement for grounded theory studies, where the goal is to find a homogenous sample. Phenomenology requires the seeking out of individuals who have experienced the ‘phenomenon’ (criterion based sampling) and ethnography requires the cultural group to be accessed (representative based sampling) (Creswell, 1998).

Collecting and recording data

Four key decisions underpin data collection:

1. degree of structure for the interviews and/or observation (is the agenda being driven by the researcher or the participants?);
2. timing (are you wishing to observe, or interview following, key events such as weaning from ventilation?);
3. number of participants (e.g. individual or group interviews);
4. location (whose territory?).

All decisions must be made in the context of the aims of the study. Interview data can be collected through individual or focus group interviews. The use of focus group interviews has to be driven by the additional synergy (data!) to be gained through the group process, and this synergy should be demonstrated in the presentation of data. The use of group interviews predominantly for the researcher’s convenience is considered bad practice and can result in poor quality data.

Recording of observation data can be achieved using video or audio taping, in addition to field notes. Observation data also commonly involves recording a ‘map’ of the setting in narrative or graphic form, for example ICU layout, staffing and workload during the observation period. This is particularly important for ethnographic studies.

Resolving field issues

It is essential to outline from the start the role to be taken by the researcher. This is of particular importance in observation studies where the role is typically a blend of observation and participation. Qualitative researchers also have to be sensitive (reflexive) to the ways in which the researcher and the research process have shaped the data, including the role of prior assumptions and experience (Mays and Pope, 2000). Currey et al. (2003) provide a useful discussion of the issues involved in observation research in intensive care settings.

Validity and reliability

In general, the rules applied to quantitative studies in order to achieve validity and reliability are not appropriate for qualitative research. Guba and Lincoln’s (1989) three criteria for qualitative studies are most commonly applied:

1. credibility – return data to the subjects for verification (e.g. return transcripts or analysis to individual participants, or discuss early analysis at focus group interviews);
2. transferability – of the theory, rather than ‘sample to population’ generalisability;
3. dependability – auditability, use of a ‘decision trail’. Researchers often use a narrative diary to record theoretical, methodological and analytical choices.

Inter-coder reliability is also used to establish dependability of the data analysis. The most common approach requires two researchers to code the same transcript and then compare coding. Inter-coder reliability will not be established if a consensus approach is taken as this may suppress, rather than illuminate, the inter-coder differences. Another pitfall to avoid is the use of only those data on which there is inter-coder agreement; this results in data being selected because they suit the research method, rather than because they represent the phenomenon/situation being studied.

The following strategies can also help to improve/verify the trustworthiness of the data:

– triangulation, using multiple data sources,
– using credible informants,
– prolonged and persistent observation (can increase credibility of the researcher),
– continuous data analysis, enabling any contradictions to be clarified ‘in the field’,
– searching for conflicting evidence (negative cases),
– observing at different times of the day,
– acknowledging and documenting the impact of the researcher on the situation.

Data analysis

A central tenet of qualitative research is early data analysis whilst data collection continues. This overlapping of the two stages allows the analysis to guide subsequent data collection, either through theoretical sampling (essential for a grounded theory study) or through amending interview/observation instruments to ensure emerging areas are explored. For example, during an interview with relatives exploring stressful events in ICU a specific situation may be raised by the relatives. Subsequent data collection may target participants who would have witnessed a similar event (theoretical sampling) or explore such a scenario with all participants. This interplay between data collection and analysis is also essential to identify the point at which data saturation occurs.

Qualitative data analysis is choreographed (Miles and Huberman, 1994) not lifted off the shelf. Some methodologies have specific processes for data analysis (see Ball and Cox, 2003 for an example of grounded theory data analysis and Arslanian-Engoren and Scott, 2003 for one approach used in phenomenology). Common to all approaches is the process of developing codes and categories. General categories (or themes) may be developed from the data, which are then broken down into more explicit codes. Alternatively, line-by-line analysis of transcripts is used to develop codes, which are then built up into categories/themes. A third approach is to use a pre-determined framework for codes, for example, Carper’s (1978) four ways of knowing or Benner’s (1984) novice to expert framework. A number of software packages are available to assist in data analysis (e.g. N-Vivo QSR International Pty Ltd, Melbourne: Victoria); these all have a specific application but commonly work on a 'node and tree' approach. It is essential to use a coding system for reporting data (e.g. Participant A/Interview 1/date). For qualitative studies this is the equivalent of identifying statistical significance as it enables the reader to judge whether the data have been used selectively to pursue a line of thinking. If 20 participants were involved in a study but the paper only reports data from 8, this demonstrates a level of selection bias.

The findings from ethnographic research are presented as a narrative (an ethnography), augmented by tables, figures or sketches; in ICU this might include a floor map of the layout or organisational map to identify how many staff are at different levels/in different roles.

Phenomenological research is presented as a narration of the essence of the experience or phenomenon and grounded theory results in a visual model or theory. For a fuller description, see Creswell (1998).

Conclusions

A number of different approaches can be taken in qualitative research and the roles of researcher and participant are much less prescribed than in quantitative studies. The choices made must be appropriate for the skills of the researcher and the timeframe and resources available for the research. However, the usefulness of qualitative studies can only be judged if such decisions are made explicit (for example, what ‘theory’ underpinned the theoretical sampling? Why was observation only undertaken during the day?). Qualitative studies have much to offer both in terms of guiding practice (through providing rich insights into the experiences of patients, relatives and staff in critical care) and identifying areas/variables to be explored in future studies.
References


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