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Research Made Simple Series

Title: Qualitative data analysis: a practical example

The aim of this paper is to equip you with an understanding of the principles of qualitative data analysis and offer a practical example of how analysis might be undertaken in an interview based study.

What is qualitative data analysis?

Qualitative research is a generic term that refers to a group of methods, and ways of collecting and analysing data that are interpretative or explanatory in nature and focus on meaning. Data collection is undertaken in the natural setting, such as a clinic, hospital or a participant's home because qualitative methods seeks to describe, explore and understand phenomena from the perspective of the individual or group . Reality is co-constructed by the research participants and the researcher, with the depth of data collected more important than recruiting large samples. The individual interview is the most widely used method of data collection in qualitative research but a range of data can be collected including field notes, audio and video recordings, images or documents. Qualitative researchers usually work with text when analysing data; data can be transcribed in entirety or focus on selected sections. However, focusing on selected sections of the data may not capture the nuances of observations or participants' descriptions and may fragment the data. The challenge for qualitative researchers is to present a cohesive representation of the data, which can be

'vast', and 'messy'¹ and needs to make sense of diverse viewpoints or complex issues. The process of data analysis is to assemble or reconstruct the data in a meaningful or comprehensible fashion, in a way that is transparent, rigorous and thorough, while remaining 'true' to participants' accounts.

What are the approaches to undertaking qualitative data analysis?

Although qualitative data analysis is inductive and focuses on meaning, approaches to analysing data are diverse with different purposes, and ontological (concerned with the nature of being) and epistemological (knowledge and understanding) underpinnings². Identifying an appropriate approach to analysing qualitative data analysis to meet the aim of a study can be challenging. One way to understand qualitative data analysis is to consider the processes involved³. Approaches can be divided into four broad groups: quasi-statistical approaches such as content analysis; the use of frameworks or matrices such as a framework approach and thematic analysis; interpretative approaches which include interpretative phenomenological analysis and grounded theory; and socio-linguistic approaches such as discourse analysis and conversation analysis. However, there are commonalities across approaches. Data analysis is an interactive process, where data are systematically searched and analysed in order to provide an illuminating description of phenomena, for example; the experience of carers supporting dying patients with renal disease⁴ or student nurses' experiences following assignment referral⁵. Data analysis is an iterative or recurring process, essential to the creativity of the analysis, development of ideas, clarifying meaning and the reworking of concepts as new insights 'emerge' or are identified in the data.

Do you need data software packages when analysing qualitative data?

Qualitative data software packages are not a pre-requisite for undertaking qualitative analysis but a range of programmes are available that can *assist* the qualitative researcher. Software programmes vary in design and application but can be divided into text retrievers, code and retrieve packages, and theory builders⁶. NVivo[®] and NUD*IST[®] are widely used because they have sophisticated code and retrieve functions, and modelling capabilities, which speed up the process of managing large data sets and data retrieval. Repetitions within data can be quantified and memos and hyperlinks attached to data. Analytical processes can be mapped and tracked and linkages across data visualised leading to theory development⁶. Disadvantages of using qualitative data software packages include the complexity of the software and some programmes are not compatible with standard text

format. Extensive coding and categorising can result in data becoming unmanageable and researchers may find visualising data on screen inhibits conceptualisation of the data.

How do you begin analysing qualitative data?

Despite the diversity of qualitative methods, the subsequent analysis is based on a common set of principles and for interview data includes: transcribing the interviews; immersing oneself within the data to gain detailed insights of the phenomena being explored; developing a data coding system; and linking codes or units of data to form overarching themes/concepts which may lead to the development of theory². Identifying recurring and significant themes, whereby data is methodically searched to identify patterns in order to provide an illuminating description of a phenomenon, is a central skill to undertaking qualitative data analysis. Table 1 contains an extract of data taken from a research study which included interviews with carers of people with end stage renal disease managed without dialysis. The extract is taken from a carer who is trying to understand why her mother wasn't offered dialysis. The first stage of data analysis involves the process of initial coding, whereby each line of the data is considered to identify key words or phrases; these are sometimes known as in-vivo codes (highlighted) because they retain participants' words.

Table 1: Data extract containing units of data and line by line coding

Data extract (carer) Units of data (in-vivo codes highlighted)	Early descriptive codes /Line by line coding
<p>He (the doctor) said there was <i>nothing more he could do for her</i>. I said to him, <i>can't you give her dialysis?</i> And he said, <i>no because it would kill her</i>. I suppose <i>it's too late in the day</i>. I don't know. That's the reason he gave me, <i>it would kill her</i>.</p>	<p>Nothing more they could do Wanting dialysis Treatment would kill Too late to treat Treatment would kill</p>
<p>So I don't really know, but I thought well, <i>why wait till there's only 20% function left before you tell me in the first place. So shouldn't he have told me when she could have had dialysis?</i> Shouldn't someone then have said to me, well look, <i>she can have dialysis before it got to the stage where she suddenly has 20% of function and she can't have it. Couldn't someone have mentioned it earlier?</i> You know what I'm trying to say?</p>	<p>Not being told early about prognosis/reduced kidney function <i>*Not being involved in treatment decision/ confusion</i> Missed treatment opportunity?</p>

*This early description can be tracked through the following tables, essential in demonstrating transparency

When transcripts have been broken down into manageable sections, the researcher sorts and sifts them, searching for types, classes, sequences, processes, patterns or wholes. The next stage of data analysis involves bringing similar categories together into broader themes. Table 2 provides an example of the early development of codes and categories and how these link to form broad initial themes.

Table 2: Development of initial themes from descriptive codes

Early descriptive codes/ categories	Broad initial theme
Wanting dialysis No benefit from treatments <i>*Not involved in treatment decisions</i> Poor understanding of disease management Confusion about treatments Not sure about which treatment options to take Requiring further knowledge Inadequate communication	The less informed decision

Table 3 presents an example of further category development leading to final themes which link to an overarching concept .

Table 3: Development of final themes and overarching concept

Category development	Final themes	Overarching concepts
Arduous nature of dialysis	Informed and autonomous decisions	The patients' decision
Difficulties in getting to hospital		
Previous experience of dialysis		
Age as a reason not to commence dialysis		
Uncertainty about treatment options	Less informed decisions	
<i>*Not involved in treatment decisions</i>		
Poor understanding of disease management		
Confusion about treatments		

How do qualitative researchers ensure data analysis procedures are transparent and robust?

In common with quantitative researchers, ensuring qualitative studies are methodologically robust is essential. Qualitative researchers need to be explicit in describing how and why they undertook the research. However, qualitative research is criticised for lacking transparency in relation to the analytical processes employed, which hinders the ability of the reader to critically appraise study findings⁷. In the three tables presented the moving from units of data to coding to theme development is illustrated. *'Not involved in treatment decisions'* appears in each table and informs one of the final themes. Documenting the movement from units of data to final themes allows for transparency of data analysis. Although other researchers may interpret the data differently, appreciating and understanding how the themes were developed is an essential part of demonstrating the robustness of the findings. Qualitative researchers must demonstrate rigour, associated with openness, relevance to practice and congruence of the methodological approach². In summary qualitative research is complex in that it produces large amounts of data, and analysis is time consuming and complex. High quality data analysis requires a researcher with expertise, vision and veracity.

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