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Health Promotion Journal of Australia; Aug 2009; 20, 2; ProQuest Health and Medical Complete
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Expert guidance: qualitative methods

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Introduction

You have just finished typing the fieldnotes from your final observation of the study and you proceed to file them. There, facing you, is all the material you have diligently collected. An empty feeling comes over you as you ask, 'Now what do I do?' (pp. 172-173).[1]

The above quote reflects the response that many qualitative researchers, new and experienced, have when faced with a large amount of collected data that must now be organised in a meaningful way,[2] in processes referred to as data analysis. The idea of data analysis signifies transformation. Through analytic processes the researchers turn the data, which is often voluminous, into "a clear, understandable, insightful, trustworthy and even original analysis" (p. 1).[3] There are different approaches that qualitative researchers can use to make sense of their data. Most common ones include thematic analysis, narrative analysis, discourse analysis, and semiotic analysis.[4,5] The main aim of each approach is to "understand the subject at hand" (p. 545).[4] All of these approaches have played a significant part in the qualitative research tradition.[6]

Acknowledgement

In this paper, I shall discuss the way that qualitative researchers analyse their data. I first discuss salient issues in performing qualitative data analysis, and then proceed to discuss and suggest different methods of data analysis in qualitative research. I also provide some discussion on the use of computer-assisted data analysis. Note that I have excluded discussion on content analysis method in this paper because content analysis makes use of simple statistical analysis, which is not the focus of this paper.

Qualitative data analysis: when to begin

Qualitative data analysis should commence from the beginning of research. Researchers immerse themselves in their fieldwork (be it an interview, participant observation, or published text) and then in reading, and rereading, the data, they make sense of the data they have generated. Through immersion in the data, researchers attempt to understand what they have obtained.[4]

By commencing data analysis early, researchers move back and forth between the data they have gathered and their strategies to collect new (and often better) data. As Miles and Huberman[7] suggest, this movement back and forth "can be a healthy corrective for built-in blind spots. It makes analysis an ongoing, lively enterprise that contributes to the energising process of fieldwork" (p. 50). Many other qualitative researchers advise interweaving data collection and analysis from the beginning.[3,4,8-11] I contend that we need to treat data analysis as part of the research design, the literature review, the

Abstract

Qualitative inquiry requires that collected data is organised in a meaningful way, and this is referred to as data analysis. Through analytic processes, researchers turn what can be voluminous data into understandable and insightful analysis. This paper sets out the different approaches that qualitative researchers can use to make sense of their data including thematic analysis, narrative analysis, discourse analysis and semiotic analysis and discusses the ways that qualitative researchers can analyse their data. I first discuss salient issues in performing qualitative data analysis, and then proceed to provide some suggestions on different methods of data analysis in qualitative research. Finally, I provide some discussion on the use of computer-assisted data analysis.

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formation of theory, the data collection, the ordering of data, and the writing process. All these issues will have significant ramifications of how we undertake our data analysis.

Coding in qualitative data analysis

Coding is the beginning point for most forms of qualitative data analysis.[11,12] Coding, according to Charmaz,[13] refers to the process whereby researchers define what the data are about, and it is the first step in data analysis. In carrying out coding for each piece of data, the researchers name chunks of data with a label or a name. This is referred to as a code. Often, a code in qualitative research is presented as a word or short phrase that "symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based data" (p. 3).[12] As such, coding is the first step for the researchers to move beyond tangible data to make analytic interpretations.[11,12,14,15]

Table 1 provides a list of basic questions is recommended by Flick[16] for qualitative researchers to use as their coding strategies. Flick suggests that the researchers should examine the text regularly and repeatedly with these questions, and from them, the researchers will be able to disclose the text.

Although researchers may have these types of questions in mind, Saldaña[12] suggests that we should consciously ask ourselves the following question when reading through the data: What strikes me? This question often offers to the researchers to some "surprising, unusual, or conceptually interesting" results (p. 153).[17]

Often, new and experienced researchers feel unskilled or clumsy at the beginning of the coding process[10,14,18] and may not feel confident about looking for meanings and naming the codes. However, confidence will gradually increase with continued efforts at data analysis. At the beginning of the coding stage, the researchers may find that they have a lot

of codes, and some of them may seem very descriptive and repetitive. The researchers may attempt to abandon certain codes as they believe that those codes are irrelevant or repetitive. I suggest that the researchers must be patient with this seeming surfeit of codes because they may be essential for the construction of theory. The codes we develop at the beginning will change as we delve into more data.

When I carry out my data analysis, I follow most of the advice that I have given above. I normally stick closely to the data. I often name the codes using the descriptions that I see in the data. I tend to use short names for my codes. Occasionally, I may use some fancy names or metaphors to represent my codes. And at some points, I may also use what Charmaz[13] and Saldaña[12] call 'in vivo' codes; terms or names that the participants actually use in their narratives. In vivo codes allow researchers to maintain the meanings of the participants' views and actions in their coding process.[13] So the codes I use depend on the data that I have.

Coding: steps and strategies

I wish to present the strategies that are provided by Bryman[8] (pp. 550-552) in this section, which I believe are useful for many qualitative researchers. It is crucial that the researchers commence coding as soon as possible. Similar to the practice of grounded theory research,[5,13] it is wise to start coding while data are still being collected. This will permit the researchers to have a better understanding of their data, to follow up ambiguous data and help with theoretical sampling. Additionally, it may reduce the feeling of being overwhelmed with too much data, which usually happens when the researchers commence data analysis after all the data are collected.

First, the researchers must read through the initial set of transcripts, field notes, or documents without making any notes, or attempting to interpret the data. After reading through the data, they may wish to write down a few notes about what appears to be particularly interesting, important, or significant. Then, they must read through the data again. However, this time, they should commence making marginal notes about significant categories that emerge from the data. At this stage, the researchers should try to make as many notes as possible. Initially, the notes may be very basic, and the researchers may use key words expressed by the participants or to give names to themes in the data. This is what I mean by coding.

At this point, it may be useful to generate an index of terms or names that may help the researchers to interpret and theorise the data. The researchers then review the codes. If they have two or more words or phrases that relate to the same issue, delete one of them. They must then examine closely to see if

Table 1: Basic questions used for coding strategies.

Questions	What to look for?
What?	What is the concern here? Which course of events is mentioned?
Who?	Who are the persons involved? What roles do they have? How do they interact?
How?	Which aspects of the event are mentioned (or omitted)?
When? How long? Where?	Referring to time, course and location: When does it happen? How long does it take? Where did the incident occur?
Why?	Which reasons are provided or can be constructed?
What for?	What is the intention here? What is the purpose?
By which?	Referring to means, tactics, and strategies for achieving the aim: What is the main tactic here? How are things accomplished?

the developed codes are relevant to concepts and categories in the existing literature. They must try to see if there are any connections between the codes or if there is evidence that may suggest one thing tends to be associated with or caused by something else. Then, the researchers should start to consider more general theoretical understandings in relation to the codes and data. By the time that they reach this point, they should be able to construct some general theoretical notions or concepts about their data. Attempting to outline connections between concepts and categories that they are generating is a good strategy to employ at this time. Additionally, they should try to see how these tentative concepts and linkages relate to the existing literature.

Practical tips:

- In the early stages of data analysis, do not worry about generating too many codes. You will soon find out that some codes will be useful, but others will not. It is important to be a bit inventive and imaginative at the beginning and tidy up later on.

- Recognise too that any piece of data can be coded in more than one way. Hence, you may want to play with the data and look closely to see if they can code data differently. This can be exciting.

- Codes emerge as the researchers delve into their data and look for meanings within it. This active coding allows researchers to repeatedly interact with their data and permits researchers to ask many different questions about their data. As a consequence, coding may take researchers into "unforeseen areas and new research questions" (p. 46).[13]

Writing marginal notes on the data or transcripts will allow researchers to maintain their attention to detail, and assist colleagues or other researchers to see how the researchers have coded their transcripts. Later on, marginal notes are used in the coding cycle. As you read through the transcripts again and again, new codes may be added and this can be easily done using marginal notes, which can gradually be refined into codes.[8,12,17]

Different types of qualitative data analysis

Different types of data analysis are commonly employed in qualitative research. Each type of data analysis is suitable for different types of questions asked. Researchers must decide which one will be more appropriate for their research. Researchers often combine several data analysis strategies in one study.

Thematic analysis

A common type of analysis in qualitative research is thematic analysis; sometimes called interpretive thematic analysis.[19,20]

Thematic analysis is referred to as "a method for identifying, analysing and reporting patterns (themes) within the data" (p. 79).[19] The techniques used for analysing data in thematic analysis and grounded theory are broadly similar with the main difference being that grounded theory includes theoretical sampling,[13,21] whereas thematic analysis does not.

There are two main steps in doing thematic analysis. Firstly, read through each transcript and try to make sense of the interview data. Then, as part of a collective set, the researchers need to examine the transcript and make sense of what is being said by the participants as a group.[22] Thematic analysis "involves searching across a data set – be that a number of interviews or focus groups, or a range of texts – to find repeated patterns of meaning" (p. 86).[19] Coding plays a major part in thematic analysis, and as in grounded theory, researchers need to perform initial and axial coding in order to deconstruct data, put them into codes and find links between them).[11-12] Axial coding is the step that allows researchers to connect different codes identified in the initial coding into categories and sub-categories.[22] By making connections between main categories and sub-categories, researchers can find themes in their data.

Braun and Clarke[19] (p. 87) provide some steps that I believe are useful for readers to adopt. First, researchers should make themselves familiar with their data. This means that researchers should transcribe the data themselves. They then need to read and reread the data, and write down their initial ideas about the data. Next, initial codes need to be generated by researchers looking for themes and collating codes into tentative themes. At this stage, gather all data that is related to each potential theme, then revise the themes initially developed. Now check if the themes work in relation to the codes extracted across the entire data set. Next, gather a thematic 'map' of the analysis, and then define and name the themes. It is also important to carry out an ongoing analysis to refine the themes so that clear definitions and names for each theme can be generated.

Narrative analysis

In narrative analysis, the participants' stories (narratives) are analysed, and then re-storied (retold) into a framework that will make sense to readers.[3,17] In the process of re-storying, stories are examined for key elements such as time, place, plot and scene. The stories that people tell do not necessarily appear in a chronological order[3] so they are then rewritten by placing them within a chronological order.[23] This chronology, with its focus on sequence, differentiates narrative analysis from other types of data analysis. However, researchers need to provide a causal link among ideas during the re-storying process.

Within the framework of chronology, stories will have a beginning, a middle and an end.[3] A chronology may comprise past, present, and future ideas.[24] Stories may also include elements that typically appear in novels including time, place and scene. As in good novels, other elements such as struggle (conflict, hardship), a lead actor (main character) and some causality sequences may also be included. The story-line may also include the three-dimensional narrative inquiry space that Clandinin and Connelly[24] have developed. These include: the personal and social (indicating the interaction); the past, present and future (referring to continuity); and the place (meaning situation). Information about the setting or context of the participants' experiences may also be included in the storyline. Beyond the chronology, the researchers may look for themes that emerge from the story in order to construct the meaning of the story. Therefore, narrative analysis may include both the story and emerging themes.

Gibbs[3] (pp. 63-64) suggests the following practical steps for doing narrative analysis. The researchers must familiarise themselves with the content and structure of the narratives by reading and re-reading the transcript closely. They should look for some crucial aspects of the narratives, for example: events – what has happened?; experiences – including feelings, images, meanings and reactions; accounts, explanations, excuses, which are given in the narratives, and; narrative form, including the linguistic and metaphorical form of telling the stories, which may include how the narrator and the researcher interact, characters, emplotment, metaphor, and chronological sequencing. Then, they need to write a short summary about key elements such as the beginning, the middle and the end of the story, and take note of some thematic ideas and structural points on the right margin of the transcript. They need to look for transitions between themes. They may examine texts on different kinds of transitions such as the move from a family life to becoming a single mother, and identify texts expressive of specific themes that are used at particular stages of the biography; for example, is intimate relationship only mentioned at certain stages of the participant's life history? They may make some notes about the thematic ideas that they have developed from the transcript, and then use them to indicate where the participant provides accounts for his or her actions and to exhibit the general structure of the story. They should also look for any interruptions/discontinuities that may contradict the themes and use pen or pencil to exhibit any mini-stories or sub-plots that may be located in the transcript. They may use arrows to mark the links between components, identify emotive language, imagery, metaphors and passages that may indicate the feelings expressed by the participant, and then code thematic ideas and develop a coding frame. At this stage of data analysis, use some broad themes like childhood,

marriage, parenthood, career change and retirement. Begin to connect the thematic ideas developed about the narrative within the broader literature and theories, and then carry out case-by-case comparisons. Although there may be several life histories in their research, some case-by-case comparison can be revealing. They may, for example, compare how different individuals experience similar transitions in their lives, or the views of different participants on the event in which they are all involved.

Discourse analysis

Social reality, according to Phillips and Hardy,[25] is produced through discourses. Hence, we cannot fully understand social interactions without making connections to the discourses that give meaning to them. The task of discourse analysis is then to examine the connection between reality and discourse.

Discourse analysis has different meanings and practices in different disciplines.[25-27] There are many ways of doing discourse analysis, and different theoretical perspectives in discourse analysis such as critical discourse analysis, Foucauldian discourse analysis, and interactional discourse analysis.[6,25,26,28,29] However, the central argument shared by all is a refusal to accept that "language is simply a neutral means of reflecting or describing the world"; rather all advocate "the central importance of discourse in constructing social life" (p. 172).[26]

Discourse analysts will ask different questions from conventional social scientific questions. For a study about why women decline prenatal screening and diagnostic tests, for example, discourse analysts will not try to answer the reasons why women refuse to do so, but seek to find out how the women's decisions for refusal are made, how they respond to criticism of others about their decisions, and how they re-establish their self-identity as non-compliant mothers. From careful reading of the data or texts and asking these alternative questions, discourses about conflicting ideologies of motherhood amid the medicalisation of childbirth and living in a risk society may surface as the reasons for the refusal by these women.[30]

Discourse analysis attempts to uncover "how the socially produced ideas and objects that populate the world were created in the first place and how they are maintained and held in place over time" (p. 6).[25] It aims to reveal the means in which social realities are produced. The most important contribution of discourse analysis is then to "examine how language constructs phenomena, not how it reflects and reveals it". However, it is important to note too that researchers who adopt discourse analysis tend not to claim that their way "is the only way of reading a text" (p. 188).[26] Rather, they will argue that "a discourse analysis is an interpretation, warranted

by detailed argument and attention to the material being studied" (p. 188).

Gill[26] (pp.178-89) provides some steps in using discourse analysis, as follows. First, the researchers construct their initial research questions. They then choose the data or texts to be analysed. This may mean that data may have to be collected and transcribed. A transcript has to be recorded verbatim with as many features of the talk included as possible. It should not be cleaned up or corrected in anyway and it must not be a summary. They must read and interrogate the data/text. This involves interrogating the researchers' own assumptions and the ways they make sense of realities. A great deal of 'scepticism' should be used in interrogating the data/text. Code the data/text as inclusively as possible, and then revise research questions as patterns in the data/text emerge. Analyse the data/text by examining regularity and variability in the data, formulate tentative hypothesis, and check reliability and validity through deviant case analysis, analysis of coherence, and participants' understanding (if the data is from face-to-face conversations). Finally, write up the analysis.

Semiotic analysis

Semiotics is "the study of signs, sign systems and their meanings" (p. 170).[29] According to Bryman[8] (p. 275), semiotics places particular importance on exploring the "deeper meaning" of the data. A semiotics approach attempts to reveal the processes of making meaning and "how signs are designed to have an effect upon actual and prospective consumers of those signs". Semiotics is suitable for analysing signs in our everyday life. Hence, it can be applied in not only documentary data analysis, but also to other data types primarily because of its "commitment to treating phenomena as texts".

Semiotic analysis goes further than simply analysing the themes as in thematic analysis.[31] It attempts to uncover the way meaning is formed through "a process of signification or connotation" (p. 293).[32] The aim of semiotic analysis is to find any themes that have been "omitted or repressed and/ or overlayed by other themes" (p. 43).[33] Semiotics requires the researchers to ask more questions to deepen the data analysis.

To put it simply, semiotics "is concerned to uncover the hidden meanings that reside in texts" (p. 531).[8] It invites the researchers to attempt to "see beyond and beneath the apparent ordinariness of everyday life and its manifestation" (p. 532).[8] When reading texts, researchers must bear in mind that texts may have implicit meanings. In order to do this, researchers must adopt some theoretical frameworks to deconstruct a text and the process of deconstruction must occur in a contextualised way.[31] Meaning cannot be

constructed out of an isolated text, but in relation to each other.[32]

Grbich[29] (pp. 177-178) suggests a few steps I find very useful and readers may wish to follow. The researchers need to adopt a "critical and skeptical reading" standpoint, and remind themselves that they will not accept nothing and reject nothing in the first place. They must remember that the outcome of semiotic analysis is "the production of an understanding of the text's structure, its content and its omissions". In reading through the text, perform the following tasks:

- permit the texts to argue against or challenge each other;

- look for contradictions and inconsistencies of ideas, expressions, and metaphors;

- identify any generalisations in the text and use them to demolish any principles that were used;

- argue against any argument that was made; search for and unravel or simplify "the complexities of all dichotomies, binary oppositions and hierarchies";

- attempt to read against the essence of the text in order to find other ways for reading the text; and explore links with other texts, and;

- search for the margins and pinpoint marginalised voices and hidden information.

When writing up analysis, try to allow as many interpretations as possible; try not to make any concrete statements; stay close to the language used in the text; and display their ambiguity and ambivalence. Remember you are not creating a finite text. It is only a transitional finding, so resist closure.

Semiotic researchers would argue that there are many insights that we may use and gain in the practice of semiotic analysis. Daly and colleagues[31] (p. 178) warn us that this approach indeed "conveys complexity, and mystery at the same time as sending the 'beware-of-the-dog' message – in other words, enter at your own risk". This is because we may be accused of being a non-scientific researcher totally immersed in our own indulgent world. However, we must remember that semiotic analysis aims at exploring alternative ways of interpretation.

Computer-Assisted Qualitative Data Analysis (CAQDAS)

Nowadays, there are computer-assisted programs that will assist or facilitate qualitative researchers with data analysis. I use the words 'assist' and 'facilitate' here to remind readers that computer packages are unable to analyse the data for researchers; they help the researchers to find, categorise and retrieve data/texts faster than using a manual search.[3,8,22,34-36] Often, those who are not familiar with qualitative data analysis will say that they use computer packages such as NVivo to

analyse their data. This appears to be a misunderstanding and I warn you not to say any thing like this, as reviewers will know that you lack knowledge about data analysis in qualitative research.

Most of the well-known programs are based on the code-and-retrieve theme.[22] They permit researchers to code texts while working at the computer and to retrieve the coded text. This means that the computer does all the manual tasks associated with the coding process that I provided earlier. More recently some programs have tried to provide the researchers with analytic procedures, and different facilities to help researchers examine features and relationships in the texts. Often, they are referred to as theory builders. However, it does not mean that they can build theory on their own. Rather, they have various tools that help the researchers to make comparisons and develop some theoretical ideas.

There are several computer packages that qualitative researchers have used. Three CAQDAS with common features include ATLAS.ti (now in version 5), MAXQDA (now in version 2) and NVivo (now in version 8).[3,12] Their features include: the transfer and display of rich texts; the construct of code lists as a hierarchy; permitting the researchers to retrieve texts which have been coded; allowing the examination of coded texts in the context of the original data; and permitting the writing of memos, which can be linked to codes and data.

Although CAQDAS are useful for many researchers, there are many criticisms about their use. Fielding and Lee[37] and Gibbs[3] argue that there is a sense of being distant from the data when using CAQDAS. Those who use paper-based analysis would argue that they are closer to the words of their participants. This may be because the early programs did not make it easy for researchers to move back and forth between the data to examine the context of coded or retrieved text, but recent programs have allowed this to happen. However, many researchers still wish to be closer to their data and hence CAQDAS will limit that closeness.

CAQDAS do not, and cannot, assist with decisions about the coding or about the interpretation of findings. We are warned by Minichiello and colleagues[22] (p. 252) that "the computer does not replace the analytical thinking processes underpinning 'interpretive' research". Computer programs cannot "develop propositions from the data", nor tell the researchers that there are different theories that they can apply. Any theoretical framework has to be introduced by the researchers themselves.

The code-and-retrieve process of computer programs may result in a fragmentation of the textual materials.[38] Hence, the narrative flow of the data may be lost.[8] Context is crucial in qualitative research. The de-contexualisation of the data may also occur due to the fragmentation process of coding text into chunks that are then retrieved and grouped into related fragments.[8,37] CAQDAS then may not be suitable for certain types of qualitative data. From their experience, Catterall and Maclaran[39] argue that computer programs are not appropriate for focus group data because the code and retrieve function results in a loss of the communication and interaction process that is essential in the focus group method. Some qualitative researchers[40-43] argue that the coding and retrieval features can be done through powerful word-processing software, such as Word for Windows (through the Find function) that requires a lengthy period of becoming familiar with the operations of that program.

Many students and researchers have raised the question of whether they should use CAQDAS with data analysis. Bryman[8] (p. 567) advises students and researchers that if they have a small number of cases in their research, it may not be worth the time and trouble of learning to master new software. It may also be too expensive for personal purchase, but if you have free access to the software, you may like to take the time to learn. Learning new software provides students and researchers with useful skills that they can make use of in the future. Many of my postgraduate students do take this position.

Personally, I believe strongly that computers can be very useful as adjuncts to qualitative research. CAQDAS can provide efficiencies in the data analysis process. However, computer programs are not always required, nor do they solve many of the central problems of qualitative research. I remain more ambivalent about the role of technology in helping qualitative researchers analyse their data, as I do not believe that computer packages can properly do this for us.[10,41,44] I personally do not use any computer-package for data analysis. I work closely with my data by using colour pens (and highlighters) and word-processing to cut and paste the data.

Conclusion

There are many ways that qualitative researchers can make sense of their data. Each approach offers different ways of seeing the data and different ways for the researchers to interpret the findings they generate. I have suggested several ways for making sense of the data in the paper. I hope that by now, readers would have some basic ideas of how they can analyse their data.

Data analysis is a craft (Miles & Huberman 1994).[7] It requires some skills and experience. As in any craft, the more we practise our data analysis, the more skillful we will become. At the beginning, all qualitative researchers feel overwhelmed with the data and ambivalent about the task of data analysis. But through experience and practice, data analysis will become easier.

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