In qualitative research, the researcher is the instrument of data analysis. The researcher’s ability to interpret the data and to present the findings clearly makes a qualitative research study useful. Data analysis can be said to be, “the process of breaking down, examining, comparing, conceptualizing, and categorizing data” (Strauss & Corbin, 1998, p. 57). Data analysis in any research is based on the research questions, and guided by the theoretical framework of the study. Nonetheless, there are strategies common among the various traditions in the qualitative research.

The Process of Data Analysis

Once data collection has begun, it is time for the researcher to begin data analysis. Mariano (1995) describes data collection and data analysis as proceeding “hand in hand” (p. 479). Initial data analysis guides later data collection, and this reciprocal process continues until no new findings are identified. Data analysis continues after data collection has been completed. Polit and Beck (2006) describe qualitative data analysis as “challenging, labor-intensive, and guided by few standardized rules” (p. 419).

Through the techniques described here as well as others, the researcher explores the data to answer the questions: What is going on here? What does this mean? Why do the participants behave this way? And so on. There are many whole texts written about interpreting qualitative research data. What will be provided here is an overview of some of the most common strategies. Bogdan and Biklen (2003) discuss analyzing data as a two-stage process. The first step is the data analysis, described as the “process of systematically searching and arranging the data” (p. 147), in which the researcher organizes the data into manageable units. Interpretation is the second phase of data analysis. The phases and techniques for accomplishing each step will be described.

Breaking the Data into Manageable Units

Qualitative data, usually in the form of transcripts of interviews and field notes, pile up rather quickly. The transcript from one interview translates into 20 or 30 pages of single-spaced type. Multiply this by the number of participants and the number of interviews for each participant and you have a mountain of data. The first thing needed for data analysis is a strategy for organizing the data.

Qualitative data analysis software (QDAS). Computers are an integral part of the research process from proposal through reporting findings. In the past, and for some current researchers, analysis of qualitative data often involved cutting up transcripts with scissors to separate chunks of data into codes and then storing strips of transcripts in envelopes or folders. QDAS are tools that facilitate the work of the researcher, not replace the researcher. QDAS packages were designed to “parallel and complement” (Coffey & Atkinson, 1996, p.187) the researcher’s noncomputer strategies for analysis. No QDAS will perform automatic data

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analysis. The benefit of using a textual analysis software package is to “ease the researcher’s workload, save time, and generally enhance the power of qualitative analysis” (Buston, 1997). Tak, Nield, and Becker (1999) describe a benefit of QDAS as “dramatically reducing the amount of time spent in the endless cutting, pasting, copying, and filing that is required to maintain qualitative data in an adequately organized way” (p. 112).

There are several QDAS programs on the market. The discussion of the utility of each is outside the scope of this article. It is to be noted that QDAS are not analytical tools; they are very sophisticated database software programs that can be used by the researcher to effectively manage large amounts of data easily. Usually the program includes two databases. One database holds the documents (transcripts) the other containing an index system which is created by the researcher as coding proceeds (Tak et al., 1999). The document database allows for searching documents by key word or phrase. These searches can then be incorporated into the database for subsequent analysis. Most QDAS have functions which allow the researcher to manipulate the data in such a way as to identify codes, fracture the data and store bits of data by code, and organize the codes into a structure reflective of the researcher’s thinking. The data in the index retain information that allows easy identification as to the source of the data. The software is flexible enough to allow the researcher to view the data surrounding the coded selection in the original document. The uniqueness of qualitative research is the role of the researcher as the instrument of data collection and as the instrument of data analysis.

Coding. Coding is a basic tool of the qualitative researcher. Through the process of coding, the researcher fractures the data and organizes it by the ideas contained within. There is no right or wrong process in coding. It is the knowledge and perceptions of the researcher that are used to identify the ideas in the data. Consider the paragraph of raw data below from an interview of one woman in a study by O’Dell and Jacelon (in press) concerning a woman who had vaginal closure surgery done to treat prolapse. What are the major ideas contained here? What are the major ideas and concepts used to voice problems is isolation or reticence to voice problems is isolation or reticence. Be aware that these codes may not contain the information you are looking for. How do the codes and themes change in time? Consider the code impotence in a study on the meaning of prostate surgery to older men. Before the surgery the data in the code may be focused on the participant’s concerns about becoming impotent. After the surgery the data may be focused on learning to use an adaptive device to obtain an erection.

Following careful analysis of all of the data within each code, data are analyzed between codes. Often, several codes can be connected by a theme. In the example regarding interviews of women following vaginal closure surgery, further analysis might show that a pattern of reticence to voice problems is a common theme, both in relationships with providers and loved ones, which may increase women’s feelings of isolation or hopelessness.

Patterns across themes are also important to look for. How do the codes and themes change in relation to each other?
Metaphors and other techniques. During the process of interpretation, the researcher asks, “What does this remind me of?” “How is it the same and how is it different?” Metaphors and analogies may be useful in helping expand the researchers thinking. For example, when exploring the hospitalization of older adults, early on in the data analysis Jacelon (2004) thought that the process of hospitalization for older adults was like managing an endangered species. Later the vision of the older adults body surfing helped her think about how the patient was immersed in the experience.

If the findings were a picture, what would it be a picture of? In the same study by Jacelon (2004), a colleague asked, “What color is hospitalization?” Why do you think it is that color? If the findings were a piece of music would it be rock and roll? The more ways the researcher can explore the data creatively, the richer the findings will be.

Graphs and charts can be useful for looking for changes in the data over time. Printing each transcript on its own color paper can be very effective to obtain a visual picture of the distribution of comments across interviews within a code or theme.

Memos. One of the most important steps of analyzing qualitative data is keeping a record of the decisions and revelations. Writing memos is a strategy for data analysis and interpretation often used by qualitative researchers to achieve this aim. A memo is “a conversation with oneself about what has occurred in the research process, what has been learned, the insights this provides, and the leads these suggest for future action” (Ely, Anzul, Friedman, & Gardner, 1991, p. 80). The collection of memos is the store of analytic ideas that can then be sorted and organized according to the emerging themes (Strauss & Corbin, 1998).

Although each researcher will develop his or her own style for writing memos, there are some guidelines to improve the usefulness of the memos (Strauss & Corbin, 1998).

1. Date each memo and note which codes or data it is related.
2. Title the memo with the major thought.
3. Include direct quotes from the data that support the point of the memo.
4. Memos are working documents they will evolve and become more or less relevant over time.

Pitfalls and Problems in Data Analysis

The most common problem with qualitative data analysis is premature closure. Too often manuscripts present only data or theme summaries without the benefit of insight and interpretation (Kearney, 2001; Sandelowski & Barroso, 2002). The end product of premature closure lacks the richness of a well-developed qualitative research project and does not illuminate practice. Qualitative analysis requires that the researcher push beyond the obvious to explore hidden meanings.

Another problem is tenacious commitment to a point of view. Researchers who are unable to put aside their preconceived opinions of a topic under study are in danger of simply confirming their own beliefs. Finally, following the directions, any directions for analyzing qualitative data, will not yield a satisfactory product. The hallmark of good qualitative research is creative data analysis.

Outcomes of Data Analysis

The creativity in qualitative research doesn’t end with analysis and interpretation. Once the researcher has converted the data into findings, the challenge is to convey the findings in a way that will be useful to the reader. The researcher has to become a storyteller. Koch (1998) describes the story as the research product. The researcher tells the story of the findings using all of the results of analysis. The presentation of findings is usually punctuated with examples of data that support the results.

Levels of Qualitative Data

As indicated previously, many issues contribute to the quality of the product of qualitative research. Kearney (2001) provides a way to categorize findings from qualitative research. She suggests five levels of qualitative findings, which evolve from the simplest to the most complex data analysis. The first is qualitative analysis of data collected according to an aprori framework. In this case, data are analyzed according to an existing set of ideas or framework. Kearney (2001) warns, “...one should proceed with caution when overlaying an existing theory on participants’ efforts to express their situated views” (p. 147). There is little discovery of new ideas in this type of research, and the researcher often finds exactly what he or she was looking for. This type of data analysis rarely contributes to the evidence base for practice.

The remaining four categories all have value for generating new knowledge in the qualitative traditions. Descriptive qualitative research is the second category of data analysis described by Kearney. In this case, the researcher develops a series of labeled data categories. At this level the categories are identified, but the analysis does not include relationships among categories. This type of finding may be useful to generate a list of descriptors about a specific topic (Kearney, 2001). The third category of data analysis is aimed at developing a synthesis of an experience or process. The researcher seeks to logically integrate the themes. For example, the researcher might explain how a concept or a process changes over time. The fourth category provides more complexity, depicting the variation of a phenomenon between people or across contexts (Kearney, 2001). Finally, the highest level of sophistication of qualitative data analysis yields a product that is “...a rich evocation of a situated understanding of a multifaceted and varied human phenomenon in a unique situation” (p. 149). This level of data analysis is considered the gold standard of
qualitative research, and requires analysis of data containing information on the breadth and depth of a phenomenon.

Conclusions

The techniques that the researcher uses must be consistent with the overall theoretical base of the research, and the more creative the strategies used to make meaning, the richer the final product of the research. In quantitative research, the design is often very detailed and the data analysis is foretold by the study design. The data are collected and then analyzed in discrete steps. In qualitative research, often the design is less specific at the beginning and the research design develops over time. Data collection and analysis overlap and are recursive. The data analysis phase of a qualitative study is often prolonged and extends long after the data collection has been completed. After the data have been rendered into a useful form, the successful interpretation of the data depends on the researcher’s ability to creatively identify the findings. It is rigor at this stage of qualitative research that allows nursing researchers to add important knowledge both to human understanding and clinical practice.

References


