Using Case Study Methodology in Nursing Research

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by

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Abstract

The purpose of this paper is to illustrate a research method that may contribute a unique and valuable method of eliciting phenomena of interest to nursing. Case study method can be used as a creative alternative to traditional approaches to description, emphasizing the patient's perspective as central to the process. This manuscript will define case study method, and discuss various case study designs. Approaches and tactics from a variety of disciplines, and theoretical or philosophical perspectives are discussed with an emphasis on method and analysis. The bulk of the manuscript outlines the stages used in a case study of men with chronic coronary heart disease (CHD), as well as presenting a case study protocol. Implications for its usefulness in nursing research, practice, and theory generation are discussed.

Introduction

This paper outlines the methodology that was developed during a case study of men with long term chronic CHD. The purpose of that study was to describe the experience and meaning of living with CHD across time, in an era of high technology (after 1985). Instances of using case study methodology in the nursing literature are scant and when found, are unpublished doctoral dissertations. Case study methodology can be used as a creative alternative to traditional approaches to description, emphasizing the patient's perspective as being central to the process. Contemporary practitioners and researchers have come to appreciate the subjective richness of patients recounting their experience and the meanings implicit in them to help guide practice. This paper aims to provide a useful research methodology for nurse researchers.

Defining the Case Study Method

There are multiple definitions and understandings of the case study. According to Bromley, it is a "systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest" (1990, p. 302). The unit of analysis can vary from an individual to a corporation. While there is utility in applying this method retrospectively, it is most often used prospectively. Data come largely from documentation, archival records, interviews, direct observations, participant observation and physical artifacts (Yin, 1994). According to D. B. Bromley (personal communication, May 6, 2001) the terms "case study", "case review" and "case report" are used loosely in the scientific and professional literature. The key features of a "case study" are its scientific credentials and its evidence base for professional applications. A "case review" might emphasize a critical reappraisal of a case. A "case report" might refer to a
summary of a case or to the document reporting a case. Knowing the disciplinary context and meaning of these terms is important to convey to the reader.

Case studies of individual patients often involve in-depth interviews with participants and key informants, review of the medical records, observation, and excerpts from patients' personal writings and diaries. Case studies have a practical function in that they can be immediately applicable to the participants' diagnosis or treatment.

When the unit of analysis is an individual, for example, an important concept to consider is life history. Bromley states, "The case study emphasizes the proximal causes of the behavior and circumstances, where as life history emphasizes the remote origins, and the continuities and discontinuities in the organization of behavior over a relatively long period of time" (1991, p. 86). According to Stake (1995) the case study researcher may be somewhat of a biographer focused on a phase or segment of the life of an individual. Various contemporary reports in psychology (Bromley, 1986), sociology (Creswell, 1997; Yin, 1984, 1994), and education (Stake, 1978, 1995) have studied the individual as the unit of analysis, and have used the case study method to develop rich and comprehensive understandings about people.

**Designs**

According to Yin (1994) the case study design must have five components: the research question(s), its propositions, its unit(s) of analysis, a determination of how the data are linked to the propositions, and criteria to interpret the findings. This study used standard techniques for posing research questions and defining the unit of analysis. Because the study design was focused on exploration and description, however, emphasis was placed on the purpose and aims of the study and not on formulating propositions. Moreover, the rationale for undertaking the study, and substantial review and critique of the literature provided support for understanding this case study phenomenon, chronic CHD.

In this study, the unit of analysis was men with long term chronic CHD. The context for the case study, however, included other persons and sources of information outside of the case. Additionally boundaries such as when to begin and end the case study needed to be developed. Yin concluded that operationally defining the unit of analysis assists with replication and efforts at comparison.

Stake (1995) emphasize that the number and type of case study depend upon the purpose of the inquiry: an instrumental case study is used to provide insight into an issue; an intrinsic case study is undertaken to gain a deeper understanding of the case; and the collective case study is the study of a number of cases in order to inquire into a particular phenomenon. Stake recognizes that there are many other types of case studies based on their specific purpose, such as the teaching case study or the biography. Feigin, Orum and Sjoberg (1991) state that irrespective of the purpose, unit of analysis, or design, rigor is a central concern. They suggest that while proponents of multiple case studies may argue for replication, using more than one case may dilute the importance and meaning of the single case.

**Generating Meaning from Data**
The goal of the case study method is to describe as accurately as possible the fullest, most complete description of the case. The study described in this paper merged the most useful aspects of case study with life history. An important activity was to craft useful approaches to collect meaningful data. Miles and Huberman (1994) have described 13 tactics for generating meaning from qualitative data. Such tactics range from descriptive to explanatory and from concrete to abstract (see Table 1). According to Miles and Huberman, the first three tactics tell us "what goes with what." The next two tell us "what's there." The next two help "sharpen our understanding." The next four help us "see things and their relationships more abstractly." Finally the last two help us to "assemble a coherent understanding of the data" (pp. 245-246). It may not be necessary to use all of these tactics in any one case study, but those underlined in Table 1 were used in the case being described here.

Table 1. Strategies Used to Generate Meaning

| What Goes with What      |
|--------------------------|
| Noting Patterns          |
| Clustering               |
| Seeing Plausibility      |

| What's There             |
|--------------------------|
| Making Metaphors         |
| Counting                 |

| Sharpen our Understanding|
|--------------------------|
| Making Comparisons       |
| Partitioning Variables   |

| See Things and Their Relationships More Abstractly |
|----------------------------------------------------|
| Subsuming Particulars Into the General             |
| Factoring                                           |
| Noting Relations Between Variables                 |
| Finding Intervening Variables                      |

| Assemble a Coherent Understanding of the Data      |
|----------------------------------------------------|
| Building a Logical Chain of Evidence               |
| Making Conceptual/Theoretical Coherence            |

(Adapted from Miles and Huberman, 1994).
Qualitative nursing research is made more rigorous by the integration of practice and theory, philosophy and method. Useful approaches and techniques from a variety of disciplines were merged to accomplish the methodology presented here. The next section will discuss the creation of a case study method, and its application to phenomena of interest to nursing.

**Method and Analysis**

Method and analysis occur simultaneously in case study research. Specifically, data collection and analysis occur as an iterative process, wherein the researcher moves between the literature and field data and back to the literature again. Contributions to the case study literature coming from three major sources have informed this work. Yin (1994) offers a very straightforward protocol approach for case study, emphasizing field procedures, case study questions, and a guide for the final write up. Yin claims such steps are a major tactic in increasing the reliability of the research endeavor. Similarly Stake (1995) has proposed a series of necessary steps for completing the case method, including posing research questions, gathering data, data analysis and interpretation. A remarkable distinction is Stakes’ emphasis on a more naturalistic approach, the importance of the philosophical underpinnings of case method, and the importance of the description of contexts.

Guba and Lincoln (1981) emphasize that reporting of results and interpreting findings stem from purposeful activities that fit into a taxonomy of case study types. These types are factual, interpretative and evaluative. Each case study must outline the purpose, then depending on the type of case study and the actions proposed by the researcher, the researcher could determine the possible products of the study. For example, research undertaken to describe the experience of men's experience in living with chronic CHD could be placed in both factual and interpretative categories. The researcher's actions include recording; constructing and presenting; producing a chronicle, a profile, or facts. Additionally the researcher is construing; synthesizing and clarifying; producing a history, meanings, and understandings. Such influences helped to form the following stages of this case study method.

**Stage 1 - Describing Experience**

Research questions guiding the case study ask about the description and experience of the phenomenon in question. As part of the case study protocol, Yin (1994) suggests that the set of case study questions are the heart of the method. The main function of questions is to keep the researcher focused and on track. In the study presented here, two sets of interview questions were created prior to the first interviews. These were used as a script for moving the interviewer closer to eliciting experience and meaning from participants in each succeeding interview. The questions were broad and loosely structured, following the intent of the research questions. Using techniques suggested by Schatzman and Strauss (1973), journals and logs were kept to track methodological, observational and theoretical field notes during data collection.

Next, the interview questions were accompanied by a list of possible sources of data. In order to describe the experience of living with chronic CHD across 10 to 15 years, a list of potential sources was made that included the participant, his spouse, physicians, and nurses and other possible significant key informants. The medical records in at least three settings had to be
located; hospital archives, doctors' offices and outpatient rehabilitation centers and clinics. The medical and nursing literature was a vast source of information on patient experiences in the form of standards of practice. Most of these were found in classic texts that are updated every one to three years. Additionally standards were found in published discipline-specific guidelines. Because experience across time was an important feature of this study, the researcher had to be mindful of advances in cardiac interventions after 1985. Experts were consulted from practice to validate the current standard of care.

Finally, the literature was reviewed for definitions of experience, particularly as they related to chronic CHD. For example, Strauss and colleagues (1984) and Miller (1992) referred to patients' illness experiences as their illness trajectory. Literature from the disciplines of nursing and medicine revealed a common trajectory for patients with CHD. The literature was revisited between interviews to gain a better understanding of new data. Clear conceptualizations assisted in taking definitions into the study, and combined with the other sources of data, comprised the mass of data available to study the phenomenon of interest. Thinking in metaphors, and creating simplistic models and thematic maps were essential activities in data management.

**Mapping Experience**

Mapping the data from multiple data sources is an important task. In this study, principal data were derived from two to three lengthy interviews lasting from two to two and one half hours. Assembling tables, charts and grids assisted with clustering of concepts. For example, after the first two interviews it became clear that acute cardiac experiences did not occur in isolation, rather three large dimensions of experience emerged. Experience was coded by color in the transcripts; for example red for cardiac experiences, green for health and illness experiences, and blue for life experiences. Various perspectives were bolded (spouse) or underlined (nurse or doctor) to distinguish them from the patients' (normal typeface). Finally all of these data sources were read, summarized and organized. Interviews were transcribed by a professional transcriptionist. Early models such as the one seen in Figure 1 were constructed to assist in conceptualizing dimensions and ideas that clustered together.

![Figure 1. Mapping Experience](image)

Experiences were further categorized as physiological, sociological and psychological within each dimension. Color codes, taxonomies and chronological ordering were used to manage the data that were assembled in large tables first on newsprint, then in the word processor.

**Stage 2 - Describing Meaning**
Because the meaning of experience was also central to this study, the literature on meaning that had the most relevance for this population was reviewed. Multiple perspectives were reviewed from social constructionism, medical sociology, existential analysis and symbolic interactionism. Processes similar to those used to explore and describe experience were used to study the importance of the concept of meaning. Burbank (1988) studied the meaning in life of older adults from a symbolic interaction perspective, and described a hierarchical model of meaning. The first level is labeled "meaning of signs and symbols" and represents a micro-level perspective on meaning. This level is considered a foundation or beginning of creating meaning.

The second level is "meaning of people, things and events in a person's life." This "midlevel" of meaning builds on the first and assumes that "a variety of things may be meaningful in varying degrees to different people" (Burbank, p. 13).

The final level of meaning is an abstract, macro-level, labeled "the meaning of life as a whole." Individuals may have no conscious awareness of this level of meaning, but rather function within a set of values and beliefs about life's meaning. This existential or cosmic meaning differs from the query, "what is the meaning of my life" which reflects one's need to have purpose in living.

The midlevel of meaning was most helpful for this study due to the preponderance of participants' events and situations noted in the transcripts, archives and medical records, as well as interactions with others and self. Burbank's model was not fully supported in this study, as there were periods when no meaning could be found in either of the cases. In this instance support from existential analysis was helpful. See Figure 2 for a basic model of meaning based on Burbank's work.

**Figure 2. Mapping Meaning**

Mapping Meaning

- Meaning of Symbols
- Meaning of Events
- Meaning of Life

Based on Burbank (1988)

**Mapping Meaning**

At this point in the analysis, it was clear the two cases differed widely, one being the more "textbook" case, the other the more idiosyncratic. Rather than following a traditional approach to case analysis using replication logic (Yin, 1994), efforts were focused on drawing comparisons between the two cases. Prior to analyzing instances of meaning from these cases, the original transcripts were once again reviewed and marked with a small "m" for each instance of meaning. Particular words, sentences, and passages were noted in a separate journal. Interpretations of
what patients were thinking, doing and feeling added to an understanding of the meaning of their experiences. For example, in one entry Bernie stated,

"My whole life has changed. I used to be completely different. I had no compassion for anybody or anything. I did what I want, how I want and nobody was gonna tell me what to do. And now I listen to people. …"

This analysis was accomplished across the three phases of the trajectory, and across each level of meaning. This process assisted in developing a logical chain of factors contributing to the understanding of the data. The result was a series of maps and typologies representing perspectives about the meaning of experience, from all data sources. A beginning model emerged describing the trajectory of chronic coronary heart disease (see Figure 3).
Stage 3 - Focus of the Analysis

Generalization of case study findings is limited to the case itself or types of cases. However, attention to selected details enhances the analysis and increases clarity of reasoning. Some general techniques are mentioned here that have been useful in focusing this analysis. According to Yin (1994) analysis hinges on linking the data to the propositions and explicating the criteria by which findings are to be interpreted. While generalization limits the use of case study method by some social scientists, Yin (1984) argues that theoretical generalization is to the domain of case study, what statistical generalization is to the true experiment. An important technique used to incorporate rigor into the study design is the use of the negative case to serve as a study "control". The use of the extreme case, the deviant case, and the normal case are helpful for making points of comparison.

The stand taken by Stake (1978) focuses on context-specific or "naturalistic" generalization. Such an approach resonates with readers' tacit knowledge, which helps people make connections and associations without the benefit of words. It is believed that people have the capacity for this kind of knowledge, and from it they build understandings. Both Stake and Yin have devised analytic techniques that have informed this case study design and analysis.

In this study, major themes identified with the use of maps and typologies, emerged as focal areas of the analysis. The metaphor "journey" became a central organizing concept, and was linked to a variety of subconcepts, and relationships among them were sought. Two complete cases were reviewed. Each case was analyzed separately with an eye toward describing experience and meaning. According to Feigin, Orum and Sjoberg's (1991) description, one appeared as a "normal" case and one an "extreme" case. The strategy was to focus the analysis on the journey, by concentrating on how it: 1) was tied to a physiologic state, 2) carried consequences, and 3) compared with the typical trajectory. After describing experience, describing meaning, and discovering the focus of the analysis, a study protocol emerged. A summary of the protocol components can be seen in Table 2.

### Table 2. Protocol for the Case Study of Men with Chronic CHD

- Purpose and rationale for case study
  - Significance of the phenomena of interest
  - Research questions
- Design based on the unit of analysis and research purpose
- Data collection and management techniques
  - Field methods
  - Transcribed notes and interviews
  - Mapping of major concepts
  - Building typologies
  - Member checking
- Describe the full case
- Focus the analysis built on themes linked to purpose and unit of analysis
- Analyze findings based on the purpose, rationale, and research questions
  - Patient's perspective
While this protocol differs only slightly from those in the literature, differences reflect the specificity required in a nursing study.

**Quality Control**

Investigators of a constructivist paradigm are oriented to the production of a reconstructed understanding of the social world (Denzin & Lincoln, 2000). Thus, traditional criteria of internal and external validity are replaced by such terms as trustworthiness and authenticity.

In general terms, qualitative investigations from many disciplines have come to rely on the trustworthiness criteria as described by Lincoln and Guba (1985), which include credibility, applicability, dependability and confirmability, and are constructed to parallel the conventional criteria of inquiry of internal and external validity, reliability and neutrality, respectively (p. 991).

Quality standards for case studies in psychology, for example, have been developed emphasizing the scientific and professional benefits to nursing. Fishman (1999) describes such standards, outlining quality of knowledge issues across three paradigms: the positivist model, the pragmatic model and the hermeneutic model. Such standards have relevance for nursing case studies.

Procedural guidelines for fulfilling these criteria rely heavily on methodological arguments and techniques - sampling diversity, triangulation or agreement, and monitoring bias. Lincoln (1995) posits that quality also involves the ethics of researchers with respect to their decision to embark upon the research enterprise in relation to the risk of harm to participants or their families (p. 287).

**Discussion and Implications for Nursing Research**

The methodology presented here is meant to provide nurses with a creative alternative to description, which centralizes the importance of the patient's perspective. It includes a rationale for designing the study, techniques and strategies for data collection, creative approaches to data analysis, and suggestions for reporting the findings. Such tactics are consistent with those described by Yin (1984, 1993, 1994), Stake (1978, 1995) Guba and Lincoln (1981); Lincoln and Guba (1985), and Miles and Huberman (1994). For the remainder of the paper, remarks are aimed at implications for nursing theory development and future nursing research activities.
Details of the case study alluded to here are described elsewhere (Zucker, 1999). Study findings indicated that two distinct "journeys" emerged from the data that extend the traditional model of experience, or patient trajectory found in the literature. Dimensions and categories of experience were described. The meaning that emerged from their experiences created unique trajectories for the two men. Further research into refining these dimensions and categories would be useful to extend the findings. In particular, further exploration of relationships between concepts would be a logical next step. Theory building, based on this beginning work, is necessary to support a more meaningful model of care for these patients.

Areas of nursing research that need to be considered include concept clarification of meaning and its relationship to experience. A nursing focus requires that definition must precede measurement. Second, examination of central concepts such as trajectory, visiting, denial, and depression are also important. Other themes implicit in this study, and yet to be explored are the meaning of happiness and the human spirit. Finally, investigating other chronic conditions and comparing their unique trajectories across chronic illnesses may help to understand the experience and meaning of chronic illness as a broad term.

Methodological research activities in the future include replicating this study's findings by using Yin's approach of case comparison to prior predictions (Yin, 1984). There is also a need to study women separately, as the literature has suggested that one might expect women's cardiac experiences to be very different from men's. A third consideration is to move from case study analysis to intervention studies. Studies of patient outcomes, based on a more meaningful treatment trajectory, should be geared towards measuring quality of life, the impact of nursing measures of caring, and patients' ability to incorporate healthful behaviors into their lives. Outcome studies would underscore the importance of nursing's role in caring for patients with chronic illnesses.

Summary and Conclusions

This paper outlined a case study methodology used to uncover the experience and meanings attributed to that experience in men with chronic CHD. Multiple approaches were combined to create a meaningful method of inquiry. Data collection and analysis proceeded concurrently, resulting in the assembling of analytic stages.

The first stage was defining the typical trajectory and mapping the cases’ experiences. Definition came from the literature, experience, and nursing practice. Patient interviews and other sources of information revealed three phases of experiences common to patients with CHD. Exploration of interview data and medical records uncovered three dimensions of experience and three categories of experience that could be viewed within each dimension. This analytic stage also ordered the data chronologically and placed them within the frame of reference of the data source.

The second stage of analysis focused on mapping meaning. Here theoretical support came from a model based on the symbolic interaction perspective. This model assisted in mapping the meaning demonstrated in the transcripts across the three phases of the trajectory, and across the levels of meaning. Because meaning was absent some of the time, future work in this area needs
to explore meaning in life from an existential perspective as described by Frankl (1959/63, 1969).

The third stage focused the analysis on three important notions: how experience was tied to a physiologic state, how it carried consequences, and how it compared with the typical illness trajectory. Both case studies included in-depth descriptions of individuals whose adult lives had been significantly impacted by CHD. Physiological processes, while central to experience, were only a portion of that experience. This level of analysis assisted in bringing together the notions of experience and meaning as seen within the context of life.

Case study methodology can be used as a creative alternative to traditional approaches to description, emphasizing the patient's perspective as central to the process. This method has implications for advancing nursing research, particularly nursing theory development and the generation of patient-sensitive nursing interventions.

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