The Role of Qualitative Methods in Designing Health Care Organizations

Julie K. Johnson  
*University of Chicago*  
Paul Barach  
*Massachusetts General Hospital and Harvard Medical School*

Qualitative research methodologies can play an important role in health care design as they can provide contextual data about health care settings—specifically the people, processes, and patterns that make up the daily work of providing health care. Health care is provided in complex environments with intricate webs of relationships, which represent the multiple interactions with people, information, technology, culture, and the physical environment in which the care is provided. One could ask, “Is good design possible without an understanding of the context in which the work occurs?” Qualitative methods can capture the experiential aspects of design and usability; however, certain qualitative methods are better suited to capture the complexity of health care. These include observations, focus groups, and interviews, which are discussed in depth.

**Keywords:** qualitative methods; hospital design; observations; focus groups; process mapping

Hospitals, clinics, and other health buildings occupy a unique place in our sensibilities. They are safe havens and anchors for dynamic civic and financial activity and yet highly stressful, unsafe, and fragmented in care delivery. In such settings, complexity is manifest in the patient and treatment protocols, as well as in the interdisciplinary coordination and hand-offs required between providers, the interdependence of humans with technology, the large volumes of information required for decision making, and the residual uncertainty associated with these decisions.

Authors’ Note: Please address correspondence to Julie K. Johnson, MSPH, PhD, University of Chicago, W216, MC 2007, 5841 S. Maryland Avenue, Chicago, IL, 60637; e-mail: jjohnso2@medicine.bsd.uchicago.edu.
It is widely acknowledged that the physical environment has a significant impact on health and safety (Ulrich, Zimring, Quan, & Joseph, 2004). However, hospitals have not traditionally been designed with the explicit goal of enhancing patient safety or improved quality through facility design innovations.

This article explores the use of qualitative research methodologies and discusses the role of qualitative methods as part of the health care design process. Qualitative methods offer unique tools and skill sets to help understand the needs of patients, providers, and administrators while complementing and providing context to traditional quantitative methods. This article provides an overview of qualitative research and briefly discusses the complementary roles of qualitative and quantitative methods as well as the relative strengths and limitations of qualitative research methods.

**Qualitative Methodologies in Health Services Research**

As a field of study, health services research has traditionally focused on the use of quantitative methods, which is appropriate when the focus is on hypothesis testing and verification. Data from a quantitative study can be evaluated objectively using descriptive and inferential statistics. The use of quantitative methods requires clarity about the important variables prior to the study, which are gleaned from previous studies and/or from a review of the literature. However, we often find, especially when dealing with complex issues, such as the delivery of health care, that the important variables are not clearly stated at the outset of the research. Sometimes, even when the quantitative results are clear, we would like to understand more about the contextual environment of the quantitative results. Research questions that are designed to understand the system that is producing the results, to explore how interdependent individuals and groups function (or fail to function), and to connect the research to reality may be best answered by qualitative methodologies.

When choosing a research methodology (qualitative or quantitative), one starts by clearly identifying the question(s) one wishes to answer. Examples of the types of questions related to health care design where qualitative methods could provide insight include the following.

- How does noise influence patient moods, drug needs, and outcomes?
- How does lack of sunlight influence patient moods, drug needs, and outcomes?
• What is the role of adjacencies and space layout in supporting team functions in complex health care settings?
• Why do hospitalized patients fall out of bed on their way to the bathroom?
• What happens when patients get transferred from one ward to another? What information is lost?
• What is the role of team members in ensuring safe delivery of care?

Qualitative methods have been defined as an array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world. To operate in a qualitative mode is to trade in linguistic symbols and, by so doing, attempt to reduce the distance between the indicated and the indicator, between theory and data, between context and action. (Van Maanen, 1979, p. 520)

Qualitative methods develop theory by emphasizing narrative description and analysis. Data are in the form of words and are evaluated subjectively and systematically by reducing the information into themes and categories. There are several fundamental assumptions underlying qualitative methods, such that they

• build on the theme of naturalistic inquiry, which is a discovery-oriented approach that minimizes manipulation of the study setting by the investigator and places no prior constraints on the outcomes of the research (Guba, 1978);
• are inductive to the extent that the research design allows important themes to emerge from patterns found in the data (Guba, 1978); and
• provide a holistic perspective, which considers the phenomenon under study to be part of a system and is not conducive to being reduced to a few variables with a clear cause-and-effect relationship (Guba, 1978).

Qualitative methods enable organizations to gain a deeper understanding of processes and phenomenon as they exist in their own unique environment (Miles & Huberman, 1994). The most widely recognized types of qualitative research methods are ethnographic and include interviews, focus groups, and observations. Ethnography evolved from cultural anthropology and focused on cultural patterns of village life; as a research methodology, it asks questions about what can be learned from the local people (or the natives). Ethnography in health services research focuses on the effects of culture on health care, institutions, or professional
groups as a cultural setting and people’s perceptions and thoughts as they go about their work. The data that result from these types of methods are generally in the form of field notes and would be analyzed through an iterative process of coding the text and reducing it to themes and categories (Miles & Huberman, 1994).

### Overview of Qualitative Methods—Observations, Interviews, and Focus Groups

Certain methodological approaches are better suited to capture the complexity of health care. These include observations, focus groups, and interviews.

Observations are a large part of our daily lives and often a good starting point with a qualitative study (Hoff & Sutcliffe, 2006). The results can be used alone or to define future studies that will draw on other methods. If conducting an observational study, one would spend time in the setting under study and makes firsthand observations of the activities and interactions. The researcher takes voluminous field notes, which would be organized into readable narrative description with major themes, categories, and illustrative case examples. To conduct an observational study, the researcher decides what to observe, then pilot tests a few observations to find out whether they have correctly identified where the opportunities are. For example, in designing an operating room space, we would need to consider the extensive list of behaviors and actions of the surgeons, nurses, anesthesiologists, as well as the technicians, the bed transport system, and the administrative support staff. In a busy operating room setting, this team can be up to several hundreds of people. Often, it is helpful to develop a method that makes it easy to capture the data, such as a checklist of observed behaviors.

Interviews provide a mechanism to find out what is on someone’s mind and to access that person’s perspective. This can be coupled with a talk-through analysis to help complete the task analysis (Ericsson & Simon, 1993). Interviews can take several forms:

- **Informal conversational interview**: Questions flow from the immediate context and varies from interviewee to interviewee.
- **Interview guide**: A list of questions or issues that are to be explored during the interview, everyone is asked about the same issues, but the questions may vary based on individual response.
- **Standardized open-ended interview**: Asks the exact same questions to each person. This approach minimizes interviewer bias.
Focus groups originated in business administration and marketing and have been used to obtain a range of opinions on products with the goal of enhancing market strategy. The difference between one-on-one interviews and focus group interviews is the ability to interact with other participants around the focus group questions. The specific questions are included in a script that is prepared prior to the focus group interview. The goal of focus group interviews is to create and capture a rich dialogue among the participants. To do this, the facilitator needs to create the environment for the participants to engage themselves in the topic as well as with one another. Verbal probes are used to keep the conversation going and ensure that the facilitator has incorporated everyone’s input.

The use of appreciative inquiry (AI) in designing interview or focus group questions is an important consideration. AI involves the art and practice of asking questions that strengthen a system’s capacity to apprehend, anticipate, and heighten positive potential (Cooperrider, Sorensen, Whitney, & Yaeger, 2000). An example of a question written from an AI perspective is, “Can you provide an example of when a patient hand off worked well?” Using this technique, images of the future start to emerge out of grounded examples from an organization’s positive past (Cooperrider et al., 2000).

Prior to conducting interviews or focus groups, the researcher should pilot test the questions with a group of people similar to those participating in the study. The pilot test provides invaluable information about the wording of the questions (e.g., does the question ask what you want it to ask) and the amount of time needed for each question, person, and the focus group.

Interviews and focus groups should either be tape-recorded or captured nearly verbatim by a dedicated note taker. The facilitator should not act as the note taker; this allows the facilitator to give his or her full attention to the flow of conversation. Finally, following the completion of each focus group and interview, notes and audiotapes are transcribed for analysis.

Analysis of Qualitative Data

There are many ways to analyze qualitative data, including grounded theory, content analysis, semiotics, narrative analysis, and textual analysis (Hoff, 2000; Miles & Huberman, 1994). These approaches vary in their specific goals. For example, grounded theory aims to develop generalizable theory inductively, whereas semiotics identifies the meanings that individuals and groups attach to cultural forms such as language, signs, and symbols. Although they have different goals, they share two important elements: (a)
close attention to the context embedding a phenomenon and (b) dedication to a process of collecting, coding, and linking data that is interactive and relies on the use of interpretive instead of (or in addition to) statistical procedures (Hoff, 2000). The goal in all these methods is to develop a detailed representation of the words and actions and hopefully to capture the thoughts behind them.

A variety of software packages are available to analyze the qualitative data; for example, Atlas.ti, NVivo, and NUDIST are widely used packages. The software does not analyze the data, but it provides a database that can be searched, indexed, and coded according to keywords, concepts, or emerging themes. Software for qualitative research should be selected based on the needs of the researchers and the types of data that will be analyzed. Analysis of the transcripts is accomplished by assigning descriptive codes to each group of words to identify emerging themes across multiple interviews.

Applying the Results of Qualitative Data to Understand the Microsystem

The results of qualitative methods can be used to help develop an understanding of the system, at various levels of granularity. The essential elements of the microsystem include the patients, clinicians, and support staff; information and information technology; and the care processes. The clinical purpose and its setting define the essential components of the microsystem. Microsystems evolve over time, and they respond to the needs of their patients and providers, as well as to the external pressures such as regulatory requirements. Previous research on clinical microsystems has identified 10 success factors, as summarized and defined in Table 1 (Batalden et al., 1997; Mohr, 2000; Nelson, Batalden, Mohr, & Plume, 1998). Qualitative methods have been used to understand processes and outcomes of care in designing and redesigning care around the clinical microsystem (the core team of providers and staff caring for a population of patients; Barach & Johnson, 2006; Galvan, Bacha, Mohr, & Barach, 2005).

Qualitative research on high-performing microsystems has underscored the importance of process literacy coupled with effective measurement. Furthermore, a high degree of process awareness often drives the design of the work. For example, the Spine Center at Dartmouth Hitchcock Medical Center provides an example of designing and implementing a program based on microsystem concepts (Weinstein, 1998). The Spine Center was built on a detailed understanding of core and supporting processes that would be required to provide
### Table 1
Characteristics of High Performing Microsystems

<table>
<thead>
<tr>
<th>Microsystem Characteristic</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Leadership</td>
<td>The role of leaders is to balance setting and reaching collective goals and to empower individual autonomy and accountability through building knowledge, respectful action, reviewing, and reflecting</td>
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<tr>
<td>Organizational support</td>
<td>The larger organization looks for ways to support the work of the microsystem and coordinate the hand-offs between microsystems</td>
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<tr>
<td>Staff focus</td>
<td>There is selective hiring of the right kind of people. The orientation process is designed to fully integrate new staff into culture and work roles. Expectations of staff are high regarding performance, continuing education, professional growth, and networking</td>
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<tr>
<td>Education and training</td>
<td>All clinical microsystems have responsibility for the ongoing education and training of staff and for aligning daily work roles with training competencies. Academic clinical microsystems have the additional responsibility of training students</td>
</tr>
<tr>
<td>Interdependence</td>
<td>The interaction of staff is characterized by trust, collaboration, willingness to help each other, appreciation of complementary roles, respect and recognition that all contribute individually to a shared purpose</td>
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<tr>
<td>Patient focus</td>
<td>The primary concern is to meet all patient needs—caring, listening, educating, and responding to special requests; innovating to meet patient needs; and smooth service flow</td>
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<tr>
<td>Community and market focus</td>
<td>The microsystem is a resource for the community; the community is a resource to the microsystem; the microsystem establishes excellent and innovative relationships with the community</td>
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<tr>
<td>Performance results</td>
<td>Performance focuses on patient outcomes, avoidable costs, streamlining delivery, using data feedback, promoting positive competition, and frank discussions about performance</td>
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<tr>
<td>Process improvement</td>
<td>An atmosphere for learning and redesign is supported by the continuous monitoring of care, use of benchmarking, frequent tests of change, and a staff that has been empowered to innovate</td>
</tr>
<tr>
<td>Information and information technology</td>
<td>Information is the connector—staff to patients, staff to staff, needs with actions to meet needs. Technology facilitates effective communication, and multiple formal and informal channels are used to keep everyone informed all the time, listen to everyone’s ideas, and ensure that everyone is connected on important topics</td>
</tr>
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Note: Adapted from Batalden et al. (1997), Mohr (2000), and Nelson et al. (1998).
care. Linking performance and outcome data to the microsystem processes provides a helpful way to identify potential areas of focused improvement that does not focus on the individual but instead on the system that is producing the processes and outcomes of care (Mohr, 2000). The microsystem does not focus exclusively on outcomes; rather, it gives comparable attention to processes and structure, to the linkages among them, and to how they interact, respond, and meet the needs of the patient population.

An essential element amenable to qualitative assessment in system analysis and monitoring is a physical process and functional system mapping. The mapping is based on a comprehensive task analysis that takes into consideration the subelements and superelements that allow the microsystem to function. Task analysis is a method used to describe and analyze how an individual (surgeon, nurse, patient, etc.) interacts both with the system itself and with others within that system. Task analysis describes what an individual is required to do, in terms of cognitive processes, actions, or both, to achieve the system’s goal. The task analysis is carried out by researchers who observe the process of care, interview and detail experts, and carefully break down the multiple elements that are part of the microsystem. Figure 1 illustrates the complex interaction between the team (in this example, a team in the operating room), the support services and hospital providers, as well as the organizational structures that support these functions. It provides the foundations for understanding the relationships and transactions within the system and with its surrounding systems. System mapping has two other purposes. It serves as the blueprint on which all changes, procedural and/or physical, are designed and analyzed prior to testing and implementation. It is also a marketing tool that facilitates selling the necessary changes to other teams and systems. Internal marketing of change elements and process are often overlooked. Without local championship of change, system changes often fail.

Case Example: Mapping the Process of Pediatric Cardiothoracic Surgery System

In a study designed to understand the process of pediatric cardiothoracic surgery, the researchers engaged providers and staff in a process mapping exercise to understand a microsystem designed to provide cardiovascular surgical care for children (Galvan et al., 2005). Pediatric cardiothoracic surgical team members at two large urban medical centers were asked to delineate the steps of care from the patient’s perspective, starting with the
referral for surgery until the child’s first postdischarge follow-up visit. Methods combined detailed walkthroughs, focused interviews, and task analysis to better understand the process (Barach & Johnson, 2006). The process map is shown in Figure 2. Once the process has been graphically depicted, several questions are helpful when analyzing a process map to generate improvement ideas:

- What is the goal of the process?
- Does the process work as it should?
- Are there obvious redundancies or complexities?
- How different is the current process from the ideal process?
Figure 2
Process Map of Pediatric Cardiovascular Surgical Care

Our aim is to improve the process of cardiovascular surgical care, starting with the child's referral for surgery and ending with the child's first postdischarge follow-up visit.

1. Child has initial contact with cardiologist
2. Cardiologist presents case at cardiac cath conference
   - CHD detected prenatally, in NICU, by pediatrician or other modes of presentation, such as self-referral
   - For the majority of patients, urgent/emergent cases are done as needed
3. Does the child need surgery?
   - Yes: Cardiologist notifies child/family about surgery
   - No: Cardiologist follow-up with child/family
4. Child arrives for surgery (day of, unless from NICU or PICU) (T, W, TH)
5. Child and family wait in Pre-op Holding Room (MOG)
   - Pre-op events and initial sedation
6. Transport child to OR
7. Additional diagnostic evaluation needed?
   - Yes: Anesthesia report (what happened in OR, what lines, etc.)
   - No: Discharge planning begins - case managers pull census report
8. OR team transports child to PICU
9. Child arrives in PICU and is stabilized
10. PICU receives Patient Information From Surgery, NP
11. PICU Receives Patient Information From Surgery, NP
12. Nurse sets up PICU
13. Compilied while child on table, including TEE if needed
14. PICU receives multiple updates from surgery via NP
15. OR team transports child to PICU
16. Child arrives in PICU and is stabilized
17. PICU Receives Patient Information From Surgery, NP
18. Child arrives for surgical clinic visit and/or pre-op hospital visit
19. NP calls family - Answers questions and schedules clinic visit, surgery date, pre-op visit, and/or clinic visit
20. PICU receives multiple updates from surgery, via NP
21. Anesthesia report (what happened in OR, what lines, etc.)
22. Discharged Home (from PICU, Intermediate, or Floor)
23. First Follow-Up in Clinic (1-2 weeks post discharge)

Last Updated 10-18-2004
Although mapping the process of care is an important step in designing improvements to the microsystem, it was also found to be instrumental in designing key aspects of the research protocol. The process map became a data collection tool where data were linked to individual steps in the process (Galvan, et al., 2005).

**Conducting a Qualitative Study**

Hoff and Sutcliffe (2006) summarize several key elements that are required for successfully implementing qualitative methodologies in patient safety research:

- **Trust**: Qualitative methods can be intrusive into an individual’s daily work life. Initial effort is needed so that the individuals understand your presence in their daily work.
- **Honesty**: Help study participants (those being observed, interviewed, etc.) understand why you are conducting the study and what you will do with the results.
- **Efficiency**: Brief, self-contained studies allow you and the organization to become familiar with the methods. Short-term projects can create the groundwork for more detailed studies.
- **Communication**: Ensure everyone involved in the process or phenomenon under study has the opportunity to contribute, provide feedback, and perform as research subjects.
- **Participation**: Methodological “champions” should be established to promote certain types of examinations.

**Limitations of Qualitative Methods**

Qualitative methods have several strengths as well as limitations. Although rigorous qualitative research requires a thoughtful research strategy and dedicated resources, qualitative studies can be relatively inexpensive and quick to implement, and they may not need a lot of advance work. Qualitative methods reflect workplace variety and allow you to develop a rich description of how things work in the trenches of patient care (Hoff & Sutcliffe, 2006). Qualitative methods can also provide the cross-level or “meso” research that examines individual provider behavior within the context of the clinic or group that, in turn, may be embedded within a larger organizational structure such as an integrated health system (Shortell, 1997).
Qualitative methods are labor intensive due to the extensive processes of collecting, coding, and processing data. The volumes of data that can result from a qualitative study can lead to data overload. Another limitation is researcher bias because personal insights are always part of the data as the researcher works to understand the complexities of the phenomena, the relevant processes, the interrelationships, and the ultimate effect on patient care outcomes. Patton (1994) suggests empathic neutrality is required on the part of the researcher; this means that it is necessary to be neutral to the findings by not approaching the phenomenon with the goal of confirming a preconceived hypothesis.

As with any study, limitations can be addressed through careful study design. Internal validity can be strengthened by verifying results with participants and triangulating data collection. Reliability can be assured by careful documentation of data collection and analysis. The most vexing limitation to deal with is the external validity, or generalizability, of the findings that result from qualitative research. The role of the traditional ethnographer in studying individual families, tribes, organizations, and so on has been to present field research in sufficient detail so that the case can be understood in its local context. As a result, there has been a legitimate criticism of qualitative methods that focus on individual cases, which limit the external validity of the research. In response to the lack of external validity criticism, qualitative researchers have argued that generalizability is not a goal of qualitative research, and therefore, it is inappropriate to consider it a limitation (Denzin, 1989; Guba & Lincoln, 1981). However, as we work to translate evidence-based patient safety research into design and practice that improves the safety of care, generalizability is a legitimate concern. Cross-case analysis offers a way to reconcile the need to have “thick description” of individual cases while understanding the themes and patterns that hold across cases (Miles & Huberman, 1994). External validity, or generalizability, of the findings is assured if the emerging theory is applicable in general, not just to the individual cases included in the study (Morse & Field, 1995).

Conclusions

Qualitative methods can play an important role in the design of health care facilities, because they provide insight into the complexities of the design and provision of health care. A well-designed qualitative study can help gain insight into how people interact with patients, other providers,
technology, and the environment. Qualitative data can in a short time help the design team rapidly focus on the priorities of the design process. Qualitative tools can help focus the quantitative hypothesis and thus greatly enhance the pace and efficiency of the data collection. Robust qualitative methods are meant to complement quantitative methods to arrive at a better understanding of how patient outcomes are influenced by the design of the process and the health care facility.

References


**Julie K. Johnson** is an assistant professor of medicine at the University of Chicago. Dr. Johnson’s career interests involve building a series of collaborative relationships to improve the quality and safety of health care through teaching, research, and clinical improvement, with the ultimate goal to translate theory into practice while generating new knowledge about the best models for improving care. Dr. Johnson has a master’s degree in public health from the University of North Carolina and a PhD in evaluative clinical sciences from Dartmouth College in Hanover, New Hampshire. Dr. Johnson uses qualitative research methods to better understand processes of care and the effect of the care process on clinical teams, teamwork, and patients and families. Dr. Johnson is an associate editor of *Quality and Safety in Health Care*.

**Paul Barach** is a board-certified anesthesiologist, with fellowship training in cardiac anesthesia, critical care medicine, and human factors at the Massachusetts General Hospital and Harvard Medical School. He is associate professor at the University of South Florida and presently on sabbatical at the University of Utrecht, Netherlands, focusing on the role of patient transitions and their impact on creating safe patient outcomes. Dr. Barach helped set up the Center for Safety at the University of Chicago and founded the Center for Patient Safety and Simulation at the University of Miami, Jackson Memorial Hospital, and is associate professor at the University of South Florida. Dr. Barach spent 5 years in the army focusing on safety science, injury control, team training, disaster preparedness, and medical simulation. He is the Chair of the Research Council of the Center for Health Design, member of the American Institute of Architecture Guidelines Revision Committee, is a board member of the National Board of Medical Examiners Center for Innovation (NBME), and member of the New York State National Advisory Panel on Patient Reporting (NYPORTS). Dr. Barach has been a visiting professor in 39 universities including 14 universities outside the United States, including universities in Holland, Japan, Australia, Israel, England, Switzerland, Spain, Portugal, Italy, Peru, New Zealand, Canada, Denmark, and Norway. He has worked extensively with the World Health Organization and the UK National Patient Safety Agency (NPSA) in advancing patient safety and quality improvement initiatives.