

Reading and Evaluating Qualitative Research Studies

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Qualitative research is now published across the family practice and medical literature. This article is designed to help busy family physicians decide which qualitative studies are worth reading and to provide them with the tools to appreciate and evaluate re-

search design and analysis. By using clinical analogies, the qualitative research process can be better understood. *Key words.* Family practice; family physicians; research, qualitative; critical appraisal. (*J Fam Pract* 1995; 41:279-285)

As family physicians seek information to help them make decisions about incorporating new therapies or theories in their practices,¹ they are occasionally confronted by clinical questions that cannot be answered by traditional quantitative research. It is therefore important that physicians learn how to read and assess qualitative studies. The medical literature now contains numerous qualitative studies.²⁻⁵

Just as there is no one way to perform a quantitative study, neither is there just one way to perform a qualitative one. The language of qualitative research is unfamiliar to many family physicians, and the research itself may seem "hopelessly subjective" and "unscientific."⁶ Qualitative research is an outgrowth of the psychological, sociological, and anthropological disciplines, and while the concepts used in these disciplines are not necessarily new to family physicians, the language with which they have been described may be.

An analogy to the clinical decision-making process can be a useful tool in helping family physicians read, understand, and evaluate the information found in qualitative research studies. This paper describes the qualitative research process and compares it with similar processes used by physicians in evaluating and assessing patients. A series of questions is offered to help the reader assess the quality of qualitative studies. The terminology

used by qualitative researchers, exotic for now, will become more familiar as qualitative research becomes more prevalent. Some of these terms are briefly addressed in this review, with references provided for those who wish to explore these concepts more thoroughly in the qualitative literature.

Study Question and Design

The first issue for the reader of any research study is quite basic (Table 1): what is the research question? Is it a practical, important question for the reader?⁷ Does the question look for "patient-oriented evidence that matters," or POEMs, as described by Slawson and colleagues?¹ These authors define POEMs as studies that evaluate "interventions that patients care about and that we, as clinicians, care about for our patients." Some of these research questions are best answered by a quantitative approach, some by a qualitative, and some by a combination of the two.

What type of study design is best for a particular research question? An analogy to patient care can be helpful in answering this question. Sometimes a clear finding on physical examination or a positive laboratory result can cinch a diagnosis. At other times, it is necessary to ask numerous questions, perform an extensive examination, and look for recognizable patterns, subtle inconsistencies, and hidden agendas before making a diagnosis. In research, the investigator must ask, "Given what I want to find out, what is the best research approach?" A quantitative approach seeks to carefully define and measure variables and outcomes. A qualitative approach seeks to frame

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Table 1. Questions to Ask in Reading Qualitative Research

1. What is the study question?
2. Is an appropriate research approach taken to the initial study question?
3. What is the specific study design?
• Who are the participants and how are they chosen?
• How are the data collected?
• How are the data analyzed?
4. Is the final study design appropriate for the study question?

an issue and assess it as a complex whole. For example, to answer a question about the effectiveness of a new antibiotic to treat urinary tract infections (ie, "what percentage of patients are cured?"), a quantitative approach is preferred. On the other hand, exploring the behaviors and reasonings behind patient decisions regarding diabetic treatments (eg, "why do many patients with diabetes choose not to follow dietary advice from their physician?") is better accomplished by a qualitative approach.

The study question or purpose, which serves as a "point of departure" for the reader,⁸ should be clearly stated in all research articles. In qualitative research, it is possible for the initial question to change while the research is under way, which may be difficult for the quantitatively trained reader to accept. This possibility is based on a central theme in qualitative research: data collection and data analysis proceed together and are performed by the same researchers. If the original question is found not to be the one of most importance or significance, then the original research question, study design, or both may change.^{9,10} In our clinical encounters, it is not unusual for the initial "chief complaint" given by a patient to change as the clinician asks questions and finds hidden agendas. Likewise, in qualitative research, investigators looking at the role of ethnic influences on health beliefs may shift the focus of their study when they find, after initial interviews, that the family influences are more important.

All studies, qualitative or quantitative, have a structure within which a question or subject is studied.¹¹ The structure of a qualitative research study may seem fairly "unstructured" to the traditional quantitative researcher or reader.¹² Both quantitative and qualitative research studies share the same three structural components, however: sampling, collection, and analysis of data. Qualitative studies may seem different because they are flexible and changeable, mainly owing to the iterative process, where repeated questioning (and questioning of the questions) occurs. The investigator, rather than trying to eliminate as many biases as possible by using a rigid structure, actually becomes part of the research, and describes rather than eliminates known biases.¹²⁻¹⁵ Much qualitative re-

search is done within a specific theoretical framework. However, family physicians, even those with little understanding of these theories, can read and appreciate qualitative studies by looking at these basics of a qualitative study design: participant selection, data collection, and data analysis.

Participant Selection

As in any well-done quantitative study, information should be given on how participants are chosen.⁸ A randomized sample, the standard in quantitative research, is rarely used in qualitative studies. Quantitative studies seek to minimize bias and maximize generalizability by randomization. Qualitative studies, on the other hand, aim to maximize the richness of information pertinent to the issue being studied. Some of the most common ways for selecting participants include using key informants, a purposeful sample (either random or stratified), a maximum variation sample, a homogeneous sample, a sample using selective characteristics (eg, extreme cases, important cases), or a sample of convenience.¹⁶ Key informants are individuals, often opinion leaders or valued members of a group who can provide insight into a question or issue being studied.¹⁷ Their identification as key informants should be described in a study using this sampling technique. A purposeful or intentional sample includes a proper mix of participants for the question under study, perhaps by seeking out individuals who represent both extremes of a population spectrum and assuring their inclusion in the study. Once the sample is defined, individuals within that sample may be randomly chosen or the participants may be chosen from within sample subgroups, with greater or lesser emphasis given to certain groups. A maximum variation sample includes individuals who represent diversity surrounding a chosen area, while a homogeneous sample is composed of participants with similar characteristics. Some studies, much like case reports, may have only one or a handful of participants, who are often chosen at the time the issue or study question is defined. Their identification should include why they were considered important for study. Regardless of which sampling method is chosen, justification for such sampling should be given.

Although it is less desirable than some, a sample of convenience is the sampling strategy most often used. Proximity due to location, acquaintance, or ease of communication often determines who among the population of interest are studied.¹⁸ As in a clinical encounter with a patient, in which the simplest and most common questions are not necessarily the ones that solve the clinical dilemma, a sample of convenience in qualitative research does not always represent the best study population. To

really understand a patient, physicians must ask difficult as well as "convenient" questions. In research, less convenient participants might provide new or insightful data. Unfortunately, in research, participant selection is often influenced by monetary and time constraints. Working within these constraints, a qualitative researcher should strive to define and use the most appropriate sampling strategy for answering the research question.

Data Collection

Data in qualitative studies are usually collected by means of interviews, observation, or review of documents or historical records.^{9,12,18} Because there is wide variation within these categories, a qualitative study should define in detail the data collection method(s) used. For example, interviews can be group or individual, long or short, formal or informal, structured or unstructured, single or multiple, and so forth. Since different kinds of data can be obtained within each of these types, researchers need to choose the method best suited for their study and adequately describe the type of interview used as well as why it was chosen. Stories and cognitive processes are often best understood through interviews, in much the same way that clinicians use the patient interview to learn the patient's story.⁹ Observation and participation can be a valuable tool for collecting data, especially when researchers want to examine a phenomenon in its natural setting. Observation may be brief or prolonged, and the observer may take a passive or active role, ultimately even participating in the group being observed. Behaviors, activities of daily living, and even conversations are usually studied by means of observation.⁹ Clinicians, too, find observation helpful. Watching parent-child interactions in the examination room or making home visits to see patients in their own surroundings, for example, gives physicians new insight into their patients' lives. Review of written records, including charts, journals, and letters, is another source of qualitative information available to researchers. Again, these data may be informally retrieved and studied or formally obtained, and their connection to the study question may be direct or indirect. Written records can offer insight into previous events and decision-making for both researchers and physicians, who often review medical records to help them better understand the patient's current story.

Unlike quantitative studies, for which sample size and data collection are often decided before the study is undertaken, the decision on "how much" data to collect is not as easily decided in qualitative research. The rule of thumb for qualitative researchers is that when no more new data or ideas are being generated, enough time has been spent in the collection phase.¹⁹ In a clinical setting,

physicians ask themselves similar questions: "How sure am I of my assessment? Do I need to get more history, do a more extensive examination, or order more tests?" When the answers to history questions provide no new information, and when information from examinations and tests offers only more confirmation, most physicians feel comfortable with their diagnosis and proceed to their plan. On the other hand, when new information is revealed in the history, or tests give disconfirming results, a physician usually keeps looking for more data. For this same process to occur in qualitative research, analysis must be ongoing during the course of data collection. The criteria the researchers used for stopping data collection, however, must be explicitly stated in their reports. Unfortunately, just as in clinical practice, matters of time, money, and logistics may be as important as data saturation in determining data collection endpoints.

How the data are collected is also important. Audio-taping and videotaping are common in interviews, and are often transcribed for subsequent analysis. It is important to assess the accuracy of these transcriptions. Observations are documented in researcher "field notes" or journals.¹² The training of the recorder and the timing of the notes is important in field-note accuracy. Existing documents themselves may be analyzed using various techniques. Regardless of the type of data collection technique used, researchers will often keep notes and journals of their involvement in the study and a written record of their thoughts as the study progresses.

Data Analysis

Data analysis in qualitative studies can vary from very structured and almost "quantitative" to highly intuitive and personal. Data consisting of interview transcripts are often analyzed for content using "coding" categories that can be decided a priori (before the data are collected) or ascertained from the data themselves.^{18,20} These categories can be counted in a quantitative fashion, and the data treated numerically, or they can be used for generating theories or explaining behaviors. Other types of notes or documents may be coded as well, or used in less quantitative ways, eg, the researchers immersing themselves in the data with frequent readings and discussions of the data to form theories and explanations. During the data analysis, qualitative researchers should specifically look for discrepant cases and account for them in their study.¹²

During this time of analysis, reading, discussing, and theorizing, many of the specific theories of qualitative research determine how the researcher addresses the data.^{6,9,10} Those with a *grounded-theory background* will attempt to identify the core social processes, or the "what is going on here" within a situation.^{10,21} *Ethnography*

involves identifying meanings, patterns, and passions of a cultural group.²² *Phenomenology* and *hermeneutics* both seek to understand the lived experience of individuals, and, in the case of hermeneutics, to better understand the political, historical, and sociocultural context in which it occurs.²³ *Heuristics* places a special emphasis on self-reflection in the research experience.²⁴ Other researchers use a variety of these traditional approaches to research as they attempt to find meaning in their data to help answer their research question.

After reading about the study design, including how the participants are chosen and the data collected and analyzed, the reader should return to the stated study question. Likewise, at the end of a visit with a patient, a physician returns to the patient's initial concerns and makes sure that all the appropriate issues have been addressed. Qualitative researchers, in reviewing their design, should review the study question and assist the reader in understanding how the decisions made regarding study design directly relate to answering the question.^{6,8} A review of the clinical care of patients, whether for quality improvement or individual study, also examines the clinical reasoning and decision-making that was based on information gathered through the selection of the history questions, examinations done, and tests performed. Making sure that the "studies" performed are appropriate for the question is important both for clinical care and research. Obviously, a neurological examination and a computerized tomography scan of the head, while indicated in the investigation of hemiparesis, will not help much with the chief complaint of a cough and sore throat. If a research design is inappropriate for the question, regardless of how well done the study is, it may not be sufficient to answer the study question.

Trustworthiness and Believability

Once a reader has explored the issues of study question and study design, it is necessary to ascertain if the study interpretation is valid relative to its intent. In quantitative research, readers look for validity and reliability. Although these terms are not directly applicable to qualitative research, the concepts they express are. Quantitatively, reliability is related to how reproducible measurements are, and validity is related to how the measurements reflect the "reality" or the "truth" of what is being measured.²⁵ In qualitative research, one looks not so much for validity and reliability as for trustworthiness.^{13,26,27} Lincoln and Guba¹³ have defined trustworthiness by the terms *credibility*, *transferability*, *dependability* and *confirmability*, but family physicians may find it easier to ask nine simple questions about the "interpretation" or "assessment" of

Table 2. Questions to Ask in Assessing Qualitative Research

Trustworthiness

1. Who are the investigators and what is happening to them?
2. Do the investigators keep following up?
3. Is there sufficient contact between the investigators and the participants?
4. Did the investigators become too close to their participants?
5. Did the investigators cross-check their data?
6. Did the investigators "rule out" other theories?
7. Can the reader follow how the investigators got from the problem to the plan?
8. Were there outside checks?
9. Does the study provide sufficient information for readers to determine whether the study applies to them?

Believability

- Does it all come together coherently?
- Is it parsimonious?
 - Is it consistent?
 - Is it fertile?
 - Is it clear?

Contribution

1. Is the study clinically convincing?
2. Does the study make a contribution to the discipline of family medicine?

the data (Table 2). In clinical practice, after we have gathered all the data about a patient, including history, examination, and laboratory results, we try to put it all together into an assessment of the patient's problem. A good assessment, one that is worth listening to, is one that not only adequately and appropriately diagnoses the problems but also offers an explanation of the thought processes that led to the diagnosis. In qualitative research, an interpretation worth listening to is one in which the questions are answered and the researchers clearly explain the processes that led to their conclusions. Readers of qualitative research might ask the following questions as they read a qualitative study:

1. Who are the investigators, and what is happening to them?

Knowing oneself and one's limitations and strengths is important in a physician's ability to practice the art of medicine. Self-questioning or reflexivity is also an important concept in qualitative research.²⁸ Clinicians do this when they examine the physician-patient relationship, and their role in their patient's care; researchers do it when they examine themselves and their roles with their participants.^{27,29}

What one knows about another person is important in evaluating his or her work. In a clinical setting, when a colleague or consultant gives an assessment of a patient, one judges this assessment based in part on what is known about the consultant's strengths and weaknesses as a clinician. For example, an otolaryngologist, an allergist, and a homeopath might each give different assessments of a

patient with chronic ear pain. Each specialist sees different "truths." As outsiders to the actual qualitative research project, readers must base their judgment on what they know of the study investigators based on the investigators' description of who they are and what happened to them during the course of the study.

2. *Do the investigators keep following up?*

Iteration, assessing and repeating questions in different forms, is a process clinicians use with their patients on a daily basis. By asking patients about their complaints in several ways and by following up on previous answers, clinicians are attempting to understand well enough to diagnose and treat. In qualitative research, by asking questions many ways, researchers are endeavoring to sufficiently understand the issue being studied.²⁸ As more information is gained, questions change and gain new dimensions based on what has already been learned.^{9,10}

3. *Is there sufficient contact between the investigators and the participants?*

What family physicians refer to as continuity of care is known as "prolonged engagement" in qualitative research.²⁷ In clinical practice, it is clear that as a physician has more encounters with a patient, he or she understands that patient better. Extended and numerous visits are especially helpful to physicians in understanding complex issues such as coping skills and disease adaptation. As trust is built, there are fewer misunderstandings between physician and patient. Researchers also understand their participants better when they have spent more time with them.

4. *Did the investigators become too close to their participants?*

While extended contact with patients can help a physician's understanding, there is always the risk of becoming too involved with a patient and losing objectivity and perspective. This balance is a constant struggle for caring physicians. It is a risk for qualitative researchers as well, who may become so enmeshed with their participants, that they can no longer look critically at the issues of concern.^{27,29}

5. *Did the investigators cross-check their data?*

In clinical practice, physicians consider findings from both the history and the examination in making a diagnosis. At times, data are also needed from laboratory, radiography, or other types of tests. Occasionally, input is requested from consultants and other health care professionals. Information from all these sources helps a physician to refine and feel comfortable with an assessment and plan. In qualitative research, "triangulation" is one of the more

important means of ensuring a trustworthy study.^{12,15,27} In triangulation, multiple data sources and methods are used. Examples include a study that uses interviews with participants along with reviews of existing records, or a study that interviews a wide variety of individuals to confirm information from one subgroup.

6. *Did the investigators "rule out" other theories?*

In practice, physicians will often look for information that will help prove or disprove a possible diagnosis. When a patient has chest pain, and a physician considers a diagnosis of myocardial infarction, he or she orders an electrocardiogram and blood test to look for evidence that there is or is not an infarction. Qualitative researchers must also take an active role in looking for discordant or disconfirming data.¹² It is insufficient to wait for these data to show up on their own. Just as a patient who has negative tests for myocardial infarction will need further investigation to find the cause of the chest pain, qualitative researchers look for data that might prove their theories wrong, so they can then investigate further to find out what really is going on.

7. *Can the reader follow how the investigators got from the question to the conclusion?*

Qualitative research, as in clinical practice, rarely unfolds as expected. The research design, collection and analysis strategies, and working hypotheses often change in response to unexpected findings. Clinicians also frequently change diagnostic or treatment plans in response to new information. What matters from the patient's perspective is that the change, and the physician's associated decision-making process, are transparent, that is, clearly understandable and available to the patient.³⁰ The qualitative investigator's decision-making process should be similarly apparent to the reader.

8. *Were there any outside checks?*

Especially with difficult patient problems, physicians talk with colleagues and consultants for advice or another opinion. Physicians document their decisions with a complete medical record that clearly states what decisions were made, tests ordered, specialists consulted, and so forth. When needed for billing, legal, or quality assurance reasons, this record serves as an audit of what was done in caring for the patient. In qualitative research, an audit allows other researchers and co-investigators to offer suggestions and input into the process of data analysis and theory development.^{27,31} This review by colleagues and other researchers can help clarify issues and point out overlooked investigator bias.^{12,29}

9. *Does the study provide sufficient information for the readers to determine whether the study applies to them?*

When presenting patients to colleagues, enough information must be provided so that the person listening has a good understanding of the patient and the issues involved. The same is true in qualitative research. By using what is called a "thick description," the researchers give the readers enough information for them to determine if the participants, setting, and information are pertinent to their practice and work.^{12,27}

After a reader determines that a study is trustworthy, he or she should look at whether the study is believable. A reader can assess the writing, organization, and interpretation by asking: Does the "story" make sense? In clinical practice, a "good" diagnosis is one that offers the most likely explanation for the patient's problem. It should also be consistent with known scientific data, clear to other professionals, and a good interpretation of the patient's story. A good diagnosis leads to a plan that will help the patient improve. In qualitative research, this rhetorical quality of the written study is also important. The following factors are significant in determining how well the researchers have related their story:

- *Is it parsimonious?* A good study should not have to make large numbers of assumptions in order to explain the data; economy of words and ideas is the goal.
- *Is it consistent?* A study should either conform to what is already known, or the reasons for its uniqueness and discordance should be explored and explained.
- *Is it fertile?* A well-done study should not only answer its own study question but also serve as fertile ground for other related research.
- *Is it clear?* A well-performed and well-written study should make sense and achieve explanation without redundancy, ambiguity, or contradiction.

Contribution of the Research

After reading and assessing a qualitative article, the reader is in a position to answer a most important question: what is this study's contribution? Deciding a study's ultimate usefulness to the individual reader involves all previously discussed components of the evaluation process: study question, study design, assessment of trustworthiness, and rhetorical quality. A qualitative study that asks an important and significant question yet attempts to answer it using faulty methods is incapable of advancing the

knowledge of family medicine. Researchers who perform an impressive study on an important topic but then do not address issues of trustworthiness in their report are similarly ineffective. Finally, a poorly prepared or written study usually attracts only a small audience.

"Is it clinically convincing?" is an especially pertinent question for practicing physicians to ask. The clinical questions best answered by qualitative research include who are our patients, what is it that we do, and what difference does it make? In other words, qualitative research should help us better understand our patients' lives, the context of our clinical decisions, or the impact of our clinical action on patients, families, and the community. Does the story the researchers tell "click" with a clinician's experience and help explain phenomena that they themselves have experienced? Does it motivate them to change or adapt their own practices?

By understanding study design and questions for the purpose of assessing trustworthiness, readers of the medical literature who are not qualitative researchers can better understand and appreciate qualitative studies. By incorporating qualitative as well as quantitative research articles into journal clubs and an individual physician's regular reading program, physicians will be better prepared to recognize and understand medical research that addresses "patient-oriented evidence that matters" (POEMs).¹ With this understanding, they will be able to critically analyze qualitative as well as quantitative studies before accepting and applying the findings of a research study to their own lives and practices.

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