Qualitative Research Methods for Medical Educators

Janice L. Hanson, PhD, EdS; Dorene F. Balmer, PhD; Angelo P. Giardino, MD, PhD

From the Departments of Medicine, Pediatrics and Family Medicine, Uniformed Services University of the Health Sciences, Bethesda, Md (Dr Hanson); Center for Education Research and Evaluation, Columbia University Medical Center, New York, NY (Dr Balmer); Section of Academic General Pediatrics, Texas Children's Hospital, and Texas Children's Health Plan, Houston, TX (Dr Giardino)

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Address correspondence to Janice L. Hanson, PhD, EdS, Department of Medicine, Uniformed Services University of the Health Sciences, 4301 Jones Bridge Road, Bethesda, Maryland 20814 (e-mail: jhanson@usuhs.mil).

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ABSTRACT

This paper provides a primer for qualitative research in medical education. Our aim is to equip readers with a basic understanding of qualitative research and prepare them to judge the goodness of fit between qualitative research and their own research questions. We provide an overview of the reasons for choosing a qualitative research approach and potential benefits of using these methods for systematic investigation. We discuss developing qualitative research questions, grounding research in a philosophical framework, and applying rigorous methods of data collection, sampling, and analysis. We also address methods to establish the trustworthiness of a qualitative study and introduce the reader to ethical concerns that warrant special attention when planning qualitative research. We conclude with a worksheet that readers may use for designing a qualitative study. Medical educators ask many questions that carefully designed qualitative research would address effectively. Careful attention to the design of qualitative studies will help to ensure credible answers that will illuminate many of the issues, challenges, and quandaries that arise while doing the work of medical education.

KEYWORDS: ethics; medical education; methods; qualitative research; trustworthiness

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IN THIS PAPER, we provide a primer for qualitative research, particularly as it applies to medical education. We start with an overview of the rationale for choosing a qualitative approach to research, go on to describe qualitative research methods, and end with a discussion of potential benefits of using qualitative methods. Because contrasting qualitative and quantitative research methods may set up an unhelpful dichotomy, we focus on the “goodness” of qualitative research, that is, what it promises to do well. We summarize information from seminal texts; we use the language of qualitative research but provide definitions in parentheses. When appropriate, we share our experience. Our aim is to equip readers with a basic understanding of qualitative research and prepare them to judge the goodness of fit between qualitative research and their own research questions.

WHAT IS THE "GOODNESS" OF QUALITATIVE RESEARCH?

Like quantitative researchers, qualitative researchers employ rigorous methods of sampling, data collection, analysis, and interpretation within a framework of scientific inquiry; however, they typically operate from a different set of assumptions, and therefore look through a different lens. For example, qualitative researchers may seek to understand the participants’ perspectives on phenomena of interest and to convey meanings that participants construct regarding those phenomena. They observe the natural setting in which the phenomena occur, with minimal disruption to the participants’ everyday routine. Although qualitative researchers do not ignore threats of bias, they consider the mind of the researcher an instrument of analysis and interpretation; thus, qualitative researchers respond to environmental cues, perceive situations holistically, capture nonverbal information, and explore the unexpected. Qualitative researchers employ a largely inductive approach to analyzing data; that is, they infer general principles from particulars that emerge during the study as opposed to explaining observed particulars in light of predetermined principles or theories.1 The flexibility of qualitative research in design and analysis allows for incorporation of important, but unexpected, events and findings. Finally, qualitative research draws on data in the form of words, images, and observations (recorded as written notes, photographs, audiotapes, videotapes, or drawings) that lend themselves to rich, thorough, and detailed descriptions of complex behaviors, processes, relationships, settings, and systems. In summary, the goodness of qualitative research lies in what it promises to do well: build understanding of how participants “make sense” of things; appreciate context rather than control it; exploit human potential to analyze and interpret; and provide accurate, comprehensive, and descriptive foundations.2 We surmise, as do others,3,4 that qualitative research is well-suited to answer questions about how learners and teachers make sense of the educational events in which they participate, complex learning environments, and
subtle learning relationships; learning outcomes that are best described rather than counted or measured; and previously unexplored topics in medical education. For example, questions about the informal learning or unintended consequences of curricular change are often best answered with qualitative research. Likewise, qualitative research provides tools to study domains of medical education such as professionalism, which are difficult to measure with quantitative tools.

**WHEN DOES QUALITATIVE RESEARCH “FIT” ONE’S RESEARCH QUESTION?**

As in quantitative research, the articulation of a qualitative research question begins with curiosity about something the researcher has experienced, observed, or wants to know. For example, a medical educator may have noticed that more students have chosen pediatrics as a specialty recently. Although quantitative researchers may study this by counting the occurrence of events (e.g., the number of students with and without a pediatric advisor who choose the specialty) and testing the hypothesis that having a pediatric advisor results in more students choosing to pursue pediatrics, qualitative researchers may approach the issue differently. For instance, they might ask students to explain why they choose pediatrics over other specialties and how they come to their decision. Qualitative researchers might also investigate the role of advisors and mentors, but they would not begin the study with a predetermined hypothesis. The data in the qualitative study may be, for example, students’ answers to interview questions, written answers to open-ended questions, or students’ essays.

Although qualitative research findings may stand alone, qualitative research may also provide exploratory information that generates hypotheses for quantitative inquiry. A qualitative study may explore topics that have not been thoroughly understood, leading to further investigation with either quantitative or qualitative methods. For example, a qualitative study on students’ perceptions of the learning environment in a pediatric clerkship may generate hypotheses about the characteristics of the learning environment that matter most to students, and a subsequent quantitative survey could test these hypotheses. A quantitative study may result in findings that require further explanation or more in-depth exploration, leading to a qualitative study that approaches the phenomena of the inquiry in a more open-ended way.

**HOW DOES ONE BEGIN A QUALITATIVE RESEARCH STUDY?**

For both quantitative and qualitative research, a review of the existing literature helps the researchers identify what is and is not known about the topic of the inquiry. In qualitative research, a review of the literature may include published narratives and stories as well as peer-reviewed papers in professional journals. The social science literature, including anthropology, medical anthropology, and sociology journals, may also contain pertinent research articles. As the researchers ponder the topic of interest, read other studies, and begin to hone their curiosity, overarching research questions tend to come into focus. These questions then guide the choice of a philosophical framework.

The philosophical frameworks that commonly inform qualitative research include *ethnography* (studying a culture), *phenomenology* (seeking to understand the meaning of someone’s experience), and *grounded theory* (building theory in a relatively unstudied area). These appear in Table 1, along with a definition, examples from medical education, seminal references, and sample research questions for a study on professionalism in each of the philosophical frameworks. By selecting and using one of these frameworks, the qualitative researcher

<table>
<thead>
<tr>
<th>Philosophical Framework</th>
<th>Ethnography</th>
<th>Phenomenology</th>
<th>Grounded Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitions/principles</td>
<td>The researcher studies a culture, trying to understand the meaning of experiences and interpretations from the perspective of the people who live in that culture.</td>
<td>The researcher studies the meaning of a phenomenon or a lived experience.</td>
<td>The researcher listens, observes, and immerses him/herself in qualitative data to create a theory that can be tested or studied further.</td>
</tr>
<tr>
<td>Examples/practices</td>
<td>Researchers conducted an ethnography to frame a study of the implicit curriculum and how it converged with the explicit, competency-based curriculum.</td>
<td>Researchers used a phenomenological approach to examine the lived experience of international medical graduates with the process of certification for practice.</td>
<td>Following a grounded theory approach, researchers found that residents distort the intended, holistic meaning of an integrated model of doctor competence.</td>
</tr>
<tr>
<td>Sample research questions on the topic of professionalism</td>
<td>What is the culture of professionalism in the clinical clerkships from the perspective of medical students?</td>
<td>How do medical students experience the development of their individual professional identity as a physician?</td>
<td>How do the clinical clerkships facilitate or deter the practice of professional behavior among medical students?</td>
</tr>
</tbody>
</table>
effectively adopts an approach to research. Publications based on studies using that framework can provide examples of methods for sampling and data collection, ways to establish the trustworthiness of the data, and approaches to data analysis. Reading about these philosophical frameworks can also help a researcher understand the overall approach to inquiry of qualitative research.9,10

METHODS
WHAT STRATEGIES DOES ONE USE TO SAMPLE QUALITATIVE RESEARCH PARTICIPANTS?

Qualitative research uses purposeful sampling instead of drawing a random sample and addressing the assumptions of statistical analysis techniques. The researcher chooses a sample of participants or documents to accomplish a particular purpose and to gain the insight most applicable to the research question. A qualitative researcher may decide to sample typical cases, extreme cases (those most different from typical cases), critical cases (those that may yield the most information about the phenomenon under study), or maximally diverse cases, and should explain why this sample of people or documents will likely provide data that address the question that guides the inquiry. As a study proceeds, a qualitative researcher may identify additional participants or documents likely to confirm or challenge emerging insights in an attempt to build deeper understanding and to clarify themes (a higher-order, more abstract interpretation of the data) or categories in the data. A researcher may also identify additional participants through snowball sampling (asking current participants to refer others that they know) or theoretical sampling (including participants with particular characteristics or from particular groups, based on previous research or theoretical models) to extend the perspectives that the sample represents.11 Although it is not possible to know in advance exactly how many participants will be involved, we have found it helpful—and sometimes necessary—to estimate a range of participants (eg, interviews with 10–20 students, or at least 3 focus groups with residents). However, more important than a predetermined number of participants is the sufficiency of data to confirm themes. Although it may be comforting to follow a prototype or set of prescribed guidelines for decisions about qualitative research design, we avoid prescriptions for things like sample size in this paper and instead focus on principles that guide decisions, such as whether the researcher has collected sufficient data to confirm themes.

When developing a sampling plan, a qualitative researcher should also consider various sources of data that can inform the study. Gathering and triangulating data (using multiple sources of data) from interviews, written narratives, observations, and/or review of documents, for example, will provide an in-depth understanding of the phenomenon under study. This is particularly important if the research plan calls for a case study, in which one particularly informative individual, family, collection of learners (eg, a medical school class or a particular clerkship or residency), or another group forms the focus of the study. In some instances, in-depth study of one case would provide more relevant insight or more thorough understanding than limited data about many participants. In this situation, it is especially important to consider different sources of data about the case.

Whatever the sampling strategy, qualitative researchers generally continue to observe, query participants, and/or review documents until new insights no longer occur (a point in the research process typically called saturation). To determine when the study has reached saturation, qualitative researchers analyze data while still collecting data, to ensure that the themes do sufficiently repeat and no new insights emerge before they make a decision to end data collection. Peer debriefing (discussing emerging insights and tentative themes with collaborators during data collection and analysis) also helps ensure that the sample is adequate, as evidenced by agreement among the peers that the themes repeat and they have reached saturation.12

HOW DOES ONE COLLECT QUALITATIVE DATA?

As mentioned previously, several sources of data apply to qualitative research: conversations (eg, transcripts of audio recordings of interviews and focus groups), narratives (eg, personal stories, written responses to open-ended questions), observations (recorded in field notes, photographs, or video recordings), and archival documents (eg, curriculum guides, syllabi, mission statements, minutes from meetings, and administrative files). There is also room for creativity in developing data collection strategies, such as engaging research participants as learners in a workshop, then recording and transcribing their conversations during the workshop and gathering the documents they produce as written data.13 The following paragraphs describe common techniques for gathering data. Table 2 provides a summary of data sources and data collection methods along with examples of medical education studies that use these sources and references that provide detailed guidance for collecting data.

INTERVIEWS AND FOCUS GROUPS

Interviews are conversations evoked under the guidance of a researcher for the purpose of learning about people’s feelings, thoughts, and experiences.1 In medical education research, information collected through interviews may provide a holistic understanding of the phenomena of interest from the perspective of participants. Interviews afford a personal exchange of information and are particularly appropriate in research about sensitive issues such as breaches of professionalism or medical errors.

The relationship between the interviewer and interviewee can vary in formality and structure. An informal stance facilitates a conversation in which each person affects what the other perceives and communicates. Although the interviewer directs the conversation initially, eventually the partners decide together what aspects of the topic of study to explore in depth. Structure can vary from very open-ended and flexible, in which a topic is presented to the research participant with very little guidance
about how to discuss it, to semistructured, in which a list of questions sets the main framework for the conversation and serves as a checklist to ensure that all relevant topics are discussed.

Focus groups are interviews with small groups of people (ideally, 6–10), with the goal of fostering dialogue between participants. Fairly homogenous groups allow for some comparison but enough diversity to stimulate discussion. Focus groups provide an opportunity to explore similarities and differences in perspectives and to expand participants’ views about an idea or topic. Focus groups tap into the dynamics of a conversation among several participants, and may bring to the fore group norms, cultural values, and sensitive topics. As with individual interviews, focus groups range from more structured to less structured. Although some focus group moderators tend to guide the conversation throughout the session, we have found it helpful to set the conversation in motion with a few open-ended questions and then “eavesdrop.” Qualitative researchers often tape record interviews and focus groups, which allows for more complete data than memory or notes, and therefore more thorough analysis, and decreases the likelihood of bias toward frequent or emotionally intense comments, because even rare comments are captured for review.

An interview guide can focus data collection and ensure comprehensiveness, although the interviewer remains free to pursue unexpected yet related insights and ideas during an interview. An interview or focus group guide typically consists of main questions and probing questions. Main questions link to research questions and create scaffolding for the interview, whereas probing questions help the interviewer to elicit clarifications and complete responses to the main interview questions. That said, interview questions are not static. They typically become more targeted as an interview or a study proceeds, incorporating understanding that emerges from earlier interviews.

Although there is no standard for the number or types of questions, we have found that 4 to 6 well-crafted, open-ended main questions often elicit rich conversation. More important than the number of questions is attention to how well the elicited conversation sheds light on the research question. Interview questions may be added, deleted, or revised as data collection ensues, as a way to challenge preliminary assumptions. An experienced interviewer learns to phrase questions in a way that elicits detailed descriptions, as well as to handle challenges that may arise during focus groups, such as building rapport with hesitant participants or balancing the conversation so that all participants have opportunities to contribute.

**Table 2. Qualitative Data Collection Strategies With Examples From Medical Education, and Additional Resources**

<table>
<thead>
<tr>
<th>Data Collection</th>
<th>Examples From Medical Education</th>
<th>Resources</th>
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<tbody>
<tr>
<td>Interview</td>
<td>Used to assess learning in a short stay unit, to describe physicians’ knowledge, beliefs, and experiences related to patient deaths, and to elicit ethical conflicts that residents encounter in their day-to-day training</td>
<td>Rubin and Rubin, 199517</td>
</tr>
<tr>
<td>Focus groups</td>
<td>Used to assess residents’ perceptions of the impact of restricted work hours on their education, and a forum for discussing sensitive topics in medical education, such as derogatory and cynical humor directed at patients</td>
<td>Krueger and Casey, 200017</td>
</tr>
<tr>
<td>Written narrative</td>
<td>Used to understand how students learn professionalism</td>
<td>Bleakley, 200518</td>
</tr>
<tr>
<td>Responses to written, open-ended questions</td>
<td>Used to understand the impact of peer assessment on professional development in medical school and to explore the use of parents’ comments to assess medical students’ competence in communication and professionalism</td>
<td>Krippendorff, 200451</td>
</tr>
<tr>
<td>Observation</td>
<td>Used to understand the more nuanced, tacit learning in the context of internal medicine</td>
<td>Hammersley and Atkinson, 199519</td>
</tr>
<tr>
<td>Review of documents</td>
<td>Meeting minutes were used to inform the researchers’ understanding of culture change in one medical school</td>
<td>Hammersley and Atkinson, 199519</td>
</tr>
</tbody>
</table>
during clinical experiences. Broad prompts for written narratives and requests for participants to write about experiences tend to generate detailed stories and longer written reflections, which may provide the data needed to build in-depth understanding about research questions.21

Open-ended questions on written or computer-based questionnaires and surveys generate data that focus more on preselected topics. Although these qualitative data have utility, brief written comments often lack the depth of information obtained from narratives or writing prompts. Qualitative researchers must guard against overinterpretation of data composed entirely of brief comments, although it is our experience that sufficient numbers of brief comments from a large and diverse group of participants may provide preliminary insights about a research question.

**Observations**

Using ethnographic techniques, qualitative researchers may observe and interact with teachers and learners in their natural settings for a substantial period, in a deliberate and systematic fashion, to become familiar with the setting and to gather information that participants may not recognize or may consider too trivial or extraneous to discuss.5,19 We have found ethnography, which seeks to understand a culture such as the culture of a medical school, a clerkship, or a residency, to be particularly useful when context or processes are at the heart of the research question (eg, investigating the informal curriculum). At other times, researchers may engage in more focused observation over shorter periods of time, often as a means to verify or expand information obtained through interviews, written narratives, or other data sources.

Researchers assume one of several roles while collecting data through observation, ranging from full participant to distant spectator. As in interviews and focus groups, observations become more focused as a study proceeds. A researcher will generally begin observations in a very open-ended way, observing and recording notes in a setting with little pre-established structure. Much like the evolution of interview questions, observations become more focused and address more specific questions that emerge from data collected earlier in a study.

Writing observational notes enables the researcher to capture and preserve insights that are stimulated by observations in the field.20 The researcher may jot down preliminary notes while in the field, then write more complete notes shortly afterward, with relatively concrete and detailed descriptions. As much as possible, the researcher writes these notes immediately upon leaving the field.

**Review of Documents**

Document review is a data collection technique that taps into existing sources of information. For example, program documents provide basic information about the situation and the context, insight into what people or groups of people say about themselves, and ideas for questions to pursue in later observations and interviews.21 Material contained in official and unofficial documents may make it possible to frame comparisons between ideal conceptualizations and actual observations. Syllabi, curriculum objectives, meeting minutes, vision and mission statements, program descriptions, and Web sites can all serve as documents that a researcher might review as data for a study in medical education.

**How Does One Analyze Qualitative Data?**

Qualitative data analysis is an iterative process of immersing oneself in the data and “making sense” of it. Qualitative analysis is primarily inductive; that is, it infers abstract, general ideas from the concrete, particular points.22 Qualitative researchers seek to generate a better understanding of phenomena from the concrete particulars within the data versus using general models or theories to predict what data will show. Deductive reasoning also has a place in qualitative research; what is discovered may be verified or countered by going back to the data.16

A comprehensive report on qualitative data analysis is beyond the scope of this paper, so the reader is referred to other resources.12,23,24 We have found it helpful to consider qualitative analysis as occurring in 3 passes. As displayed in the Figure, the first pass involves immersion in the data, creation of an initial code list, and then application of codes to the data. Codes are words that act as labels for important concepts. Codes are grounded in the original data and thus emerge as the inquiry ensues. In the second pass, coded data are clustered together to form cohesive and internally consistent categories. Categories of coded data may comprise themes; themes express main ideas that group several codes in a larger construct. Themes are essentially assertions the researcher makes based on the coded data; as such, themes are one step removed from the data because they are shaped by the researchers’ assumptions, experiences, and interpretations. During data analysis, researchers may record insights, including refinements of the names for themes and comments about how the themes relate to each other. Qualitative researchers often call these notes “memos,” and qualitative analysis software usually includes a space to record memos and link them to supporting data. Researchers may also consult theories from education and other disciplines to shed light on themes. In the third pass, researchers look back to their own data for evidence of relationships between themes and to confirm or disconfirm themes. In this final stage, researchers interpret their findings by making disciplined inferences, offering tentative hypotheses and building...
toward theory. At this stage of analysis, qualitative researchers may also develop a grounded theory that they may test in future qualitative or quantitative research; it is termed grounded because its foundation emerges from the data and the relationships between themes that the researcher discovers during analysis.

Qualitative analysis is a time-consuming process involving multiple iterations of understanding the data. Rigorous analysis typically involves more than one researcher, with discussion of areas of agreement and disagreement, until reaching consensus. Qualitative researchers often use software specifically designed to aid in the management of qualitative data. Examples of software include HyperRESEARCH, ATLAS.ti, and NVivo. We have found that these programs save time and can provide helpful tools for organizing and visualizing data, but they cannot replace the researcher’s scrutiny and depth of understanding.

**How Does One Establish Trustworthiness of Qualitative Data?**

Qualitative researchers incorporate particular strategies to establish the trustworthiness of their research. The areas of concern are comparable to concerns about validity in quantitative research, but the vocabulary and methods used to address the concerns are different. We have found that providing clear descriptions of our quest to establish trustworthiness in our qualitative research is critical to successful review and publication.

Table 3 provides a summary of methods to establish trustworthiness and the parallel strategies used to establish validity in quantitative research.

<table>
<thead>
<tr>
<th>Qualitative Research Criteria for Trustworthiness and Parallel Concepts in Quantitative Research</th>
<th>Qualitative Research Methods to Establish Trustworthiness</th>
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</thead>
<tbody>
<tr>
<td>Credibility (internal validity)</td>
<td>Triangulation (gathering more than one source of data and/or more than one observer)</td>
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<tr>
<td></td>
<td>Detailed evidence (gathering enough detailed data to build a credible case that the researcher has developed a good understanding of the topic of the study)</td>
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<tr>
<td>Transferability (external validity)</td>
<td>Prolonged observation (observing for long periods on multiple occasions, in order to gather detailed evidence and experience the context of the situation under study)</td>
</tr>
<tr>
<td>Dependability (reliability)</td>
<td>Skillful interview technique (using questions that generate descriptions, probing for deeper insight, asking questions in an organized fashion that helps the participants respond)</td>
</tr>
<tr>
<td>Confirmability (objectivity)</td>
<td>Multiple analyzers (more than one researcher participating in data analysis)</td>
</tr>
<tr>
<td></td>
<td>Peer debriefing (researchers discussing insights that emerge during data collection and analysis)</td>
</tr>
<tr>
<td></td>
<td>Rigorous procedures (systematic sampling, data collection, and data analysis)</td>
</tr>
<tr>
<td></td>
<td>Member checking (asking research participants if emerging insights from data analysis “make sense” in their experience and express the meaning they tried to convey in interviews, focus groups, or written data)</td>
</tr>
<tr>
<td></td>
<td>Record procedures, data, analysis, and interpretations for audit (leave a paper trail that a person who did not conduct the study can review to see if the researchers’ plan and line of reasoning makes sense)</td>
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</tbody>
</table>

The results of the study will likely transfer to a new setting with a different set of participants. The systematic application of these methods to establish trustworthiness in a qualitative inquiry moves the gathering and interpreting of qualitative data from anecdotal observation to rigorous research.
WHAT ETHICAL ISSUES MIGHT ONE ENCOUNTER IN QUALITATIVE RESEARCH?

It has been said, “Ethical issues are floating constantly beneath the surface of what qualitative researchers do.”25 Research in both quantitative and qualitative paradigms must address informed consent, benefits and reciprocity, cost and risks, privacy and confidentiality, anonymity, and dissemination of the research findings. These concerns may play out differently, however, in the context of extended in-person observation or in-depth personal interviews. In addition, qualitative researchers encounter some unique ethical concerns, and qualitative research in health care settings can raise still other ethical concerns.30 Although qualitative research rarely involves physical intervention or imposes physical risks, there may be social or psychological risks, such as possible harm to a participant’s reputation or discomfort associated with discussing sensitive issues.1 The potential for risk increases when, for example, medical students or residents feel pressured to participate or powerless to withdraw from research in which their attending physicians or preceptors have a vested interest.31,32 Qualitative researchers must pay special attention to ethical concerns that arise from relationships between researchers and participants, such as the importance of acknowledging bias, using rigorous methods, building rapport, respecting autonomy, avoiding exploitation, and maintaining confidentiality.33

The small number of cases and rich description that characterize qualitative research may challenge complete protection of the participants’ identity. For example, medical students who participate in a focus group about medical student distress and burnout may share specific examples from their own experiences in medical school, but they would not want excerpts from their personal stories of distress published in a way that could identify them or their medical school. Privacy may be protected by reporting actual accounts as composite vignettes by publishing demographic data only for the group of participants and not for individuals, and by giving participants the option of agreeing or not to the use of their quotes in publication.30

Qualitative researchers often use in-depth personal interviews to build understanding and gather data, and these interviews usually entail a deep degree of trust between an interviewer and participants. A participant may share deeply personal insights, or even speak insights that become conscious for the first time during an interview. Qualitative researchers must, therefore, remain aware of the relationship between themselves and the people they interview, taking special care to preserve confidentiality and to honor participants’ requests not to publish particular quotes.33,34 Participants’ opportunity to consider and choose to consent and to decide to end an interview must be carefully honored.35 Although these risks require attention and care, interviewees may also experience the opportunity to share their personal insights and stories as beneficial.36

DISCUSSION

As we have suggested in this paper, planning rigorous qualitative research requires prospective attention to the articulation of research questions, data collection strategies, a sampling plan, and data analysis methods, with attention to methods that establish trustworthiness throughout the study. The Appendix presents a planning worksheet to aid researchers in attending to decisions that will lead to a sound qualitative research design. Researchers who are new to qualitative research may benefit by working with a more experienced mentor, along with the worksheet, to build a deep understanding of the methodology and how to apply it to particular research questions.

Planning these steps with careful attention to choice of rigorous methods will help researchers prepare protocols for submission to an institutional review board prior to conducting qualitative research. However, we have found that it is important to stay open to change, with appropriate institutional review board notification, as it is not uncommon for qualitative research designs to be modified in response to unexpected events or preliminary findings. Qualitative researchers wade into the phenomena alongside participants. The flexibility of qualitative research can accommodate change during the study that is necessary to answer the research question. This flexibility can also accommodate important but unanticipated findings that surface in the course of an inquiry.37 Qualitative research provides not only tools but also ways of thinking about systematic inquiry that are particularly useful, and sometimes essential, for answering research questions about the meanings participants ascribe to phenomena of interest. The worksheet takes this into account and assists researchers in thinking about the critical components well in advance of carrying out their research.

We end with 2 cautionary points. First, we have discussed components of qualitative research in a linear fashion and presented them as such in the worksheet. However, it is important to understand the interconnectedness of the components. Qualitative researchers should think intentionally about the connections between questions and methods, and refine the research questions while reading the literature, adjust the methods to fit clarified questions, accommodate the methods to the research environment, and incorporate insights that emerge as the study proceeds. Second, although the worksheet provides a helpful outline for designing a qualitative study, we do not mean to imply that qualitative research can be reduced to one prototype.

The inclusion of qualitative data such as responses to open-ended questions, does not, by itself, make a study properly qualitative. In fact, a qualitative study may include numbers and measurements in the course of a thorough inquiry. As noted in the opening paragraphs, qualitative researchers approach their study with a set of assumptions that differ from, and may complement, quantitative research. When approached with the type of rigor we describe throughout this paper, qualitative research is serious scientific inquiry with a set of methods and ways of thinking that enable thoughtful, systematic research that uncovers important results, theories, and explanations.
ACKNOWLEDGMENTS

We thank Terrence Tice, Virginia Randall, Kathleen Madden, and Boyd Richards for their careful reading of this manuscript and their editorial suggestions.

REFERENCES

Appendix

Qualitative Methods Worksheet

My Research Question: ____________________________________________________________

____________________________________________________________________________

Research/Philosophical Framework: Will I…

_____ Observe a culture? Use *ethnography*.

_____ Build an understanding of an experience?
  Use *phenomenology*.

_____ Develop a theory or try to explain how
  things relate to each other? Use
  *grounded theory*.

Early Preparation:

How can I build valid questions, observation tools, or interview and focus group guides?

_____ Review the literature. Which databases?
  __________________________________________________________

_____ Consult experts. Who?
  __________________________________________________________

_____ Other. What?
  __________________________________________________________

Sampling: How will I ensure I have an adequate sample?  Notes:

_____ Define my population.

_____ Describe my sample in detail so those
  who read my study can tell if their
  population is similar.

_____ Saturation: Keep querying new
  participants until the themes repeat.

_____ Analyze data as it is collected, so I’ll
  know when themes repeat.

_____ Peer debriefing: Discuss sampling,
  emerging themes, field experiences with a
  peer investigator.
What method(s) of data collection would best help answer my question? What could be done specifically within my context/limitations/institution?

**Interviews:** Ask questions of one or two people, using open-ended and clarifying questions.

<table>
<thead>
<tr>
<th>Who and where?</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>When?</td>
<td></td>
</tr>
<tr>
<td>What questions?</td>
<td></td>
</tr>
<tr>
<td>How will I record the data?</td>
<td></td>
</tr>
</tbody>
</table>

**Focus Groups:** Ask open-ended and probing questions in groups of 6-10 people.

<table>
<thead>
<tr>
<th>Who and where?</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>When?</td>
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<td>What questions?</td>
<td></td>
</tr>
<tr>
<td>How will I record the data?</td>
<td></td>
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</tbody>
</table>

**Written narratives and responses to open-ended questions:** Identify published or existing narratives, supply writing prompts or present open-ended questions for free-text responses.

<table>
<thead>
<tr>
<th>Which narratives or who will respond?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>When and how identified or generated?</td>
<td></td>
</tr>
<tr>
<td>What questions will prompt the writing?</td>
<td></td>
</tr>
<tr>
<td>How will I record the data?</td>
<td></td>
</tr>
</tbody>
</table>

**Observation:** Watch people in the setting where what you want to study happens.

<table>
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<tr>
<th>Who and where?</th>
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<tbody>
<tr>
<td>When?</td>
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<tr>
<td>What to look for?</td>
<td></td>
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<tr>
<td>How will I record the data?</td>
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</table>
**Document Analysis:** Study reports, archives, minutes of meetings, diaries, etc.

<table>
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<tr>
<th>Which documents?</th>
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<table>
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<tr>
<th>When?</th>
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<th>How will I record the data?</th>
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**What kind of data will I collect?**

- [ ] audiotapes/transcripts
- [ ] videotapes/DVDs
- [ ] photographs
- [ ] participants’ notes written during focus groups
- [ ] flip chart notes
- [ ] drawings
- [ ] field notes from my observations
- [ ] written narratives
- [ ] documents
- [ ] written answers to questions
- [ ] other?

**Data Management and Analysis**

What system can be put in place to keep track of data and make it easy to analyze?

What should be done to ensure that future replication of data collection and analysis is possible?

Who will be responsible for collecting, managing, analyzing data?

**What resources do I need?**

- [ ] Qualitative analysis software (Atlas™, HyperResearch™, NVivo™)
- [ ] Tape recorders, tapes
- [ ] Video/DVD recorders, tapes, disks
- [ ] Observers
- [ ] Research assistant
- [ ] Transcription
- [ ] Other?
Who will perform analysis?

What specifically will I do to analyze the data?
- Create themes (read and re-read data set; develop and iteratively revise codes; cluster codes into categories)
- Write memos about insights
- Look for relationships between themes
- Propose hypotheses and/or theory

How can I improve the trustworthiness of my analysis?
- **Triangulation:** Gather multiple sources of data to see if insights are similar and themes repeat; use multiple methods of data collection; include multiple observers.
- **Member checking:** Take preliminary analysis back to respondents and verify interpretation.
- **Peer debriefing:** Work with two or more researchers and resolve all disagreements.
- **Reflexivity:** Examine my own biases in relation to the data, analysis and interpretations.
- **Audits:** Keep records of all analysis steps and allow an audit of the credibility.
- **Detailed evidence:** use prolonged observation, provide detailed description, use in-depth interviewing to collect detailed data