Qualitative and Mixed Methods Research

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Qualitative Research

*Not everything that can be counted counts, and not everything that counts can be counted.*

Albert Einstein, attributed
What is Qualitative Research?

- Exploratory
- Naturalistic
- Interpretive
  - Gain deeper understanding of underlying reasons, opinions, and motivations
- Inductive: specific to general
- Researcher is an “active learner” not “expert”
- Hypothesis generating **NOT** hypothesis confirming

Objectivity and Subjectivity

Subjectivity is expected in Qualitative Research

Objectivity is critical to Quantitative Research
What types of results do you get?

### Qualitative
- Individual stories
- Different perspectives
- Process understanding
- Data drives theory
- Individual
- Contextual

### Quantitative
- P-values, trends
- Effect sizes, odds ratios
- Cause-and-effect
- Group comparisons
- Theory drives data
- Valid, reliable, generalizable

Types of Data

#### Qualitative
- Interviews
- Observations
- Documents
- Focus groups
- Audiovisual material

- TEXT OR IMAGE DATA
  - Open ended

#### Quantitative
- Surveys
- Biomarkers
- Medical Records
- Health outcomes

- NUMERIC DATA
  - Close-ended
Sample Qualitative Research Questions

- What are the patient barriers and facilitators of illness self-management?
- What features do patients want in a self-management Smartphone app?
- How does making a medical error in the ICU psychologically impact the physician?
- How do medical residents perceive a reduction in duty hours?
- What factors affect the implementation and sustainability of an early rehabilitation program in the ICU?
- What are best practices for participant retention in a research study?

Method Design Issues

- Are you willing to trade detail for generalizability?
- Will exploratory research enable you to generate new theories?
- Can you ask such sensitive questions on a questionnaire?
- Will the results add any evidence toward any preexisting theory or hypothesis?
- Do you really need to see numbers to support your theories or hypotheses?
- Are there any ethical problems that could be minimized by choosing a particular strategy?
Steps to Qualitative Research

1. Data Collection
   - Methods:
     • Interviews
     • Observations
     • Focus groups
     • Documents, records
   - Sampling procedures

2. Analysis
   - Coding:
     • Conceptualizing and reducing data vs. elaborating concepts

Summary

• Goal = Gain deeper understanding of underlying reasons, opinions, and motivations
• Hypothesis generating NOT hypothesis testing
• Biggest threat is bias, but there are steps to reduce them or enhance transparency
• Qualitative data is a powerful compliment to quantitative data
• Qualitative research—Anyone can do it!
Consolidated Criteria for Reporting Qualitative Research (COREQ)

- Aims to improve the quality of reporting qualitative research
- Allows for a more informed reader who can critically appraise the study’s relevance
- Criteria based on a systematic review of literature


COREQ: Domain 1 - Research team

Personal Characteristics
- Who moderated?
- Researchers’ credentials
- Researchers’ occupation
- Gender
- Experience and training

Relationship with Participants
- Prior relationship?
- Participant knowledge of interviewer
  - e.g., reason for doing study
- Interviewer characteristics
  - Bias, assumptions, reason for interest in topic
COREQ: Domain 2 - Study Design

Methodological Orientation & Theory

• **Grounded Theory**
  – Build theory from data

• **Discourse Analysis**
  – Analyze linguistic expression

• **Ethnography**
  – Understand the culture of groups with shared characteristics

• **Phenomenology**
  – Describe the meaning and significance of experiences

• **Content Analysis**
  – Systematically organize data into a structured format

Study Design

Participant Selection

• **Sampling**
  – Purposeful, convenience, consecutive, snowball

• **Method of approach**
  – Face-to-face, telephone, mail, email, social media

• **Sample size**

• **How many refused or dropped out? Why?**

Setting

• **Setting of data collection**
  – Home, clinic, workplace, school

• **Presence of non-participants**
  – Healthcare provider, researchers
  – Spouse, children, parents
Sampling

- Purposive sampling
  - Select participants specifically to meet designated roles
  - Quota sampling (meet certain quotas)
- Snow ball sampling
  - Build from previous interviews
- Do not need to focus on generalizability

COREQ: Domain 2 - Study Design

Data Collection

- Interview guide
- Repeat interviews
- Audio/visual recording
- Field notes
- Duration
- Data Saturation
- Transcripts returned
Should I do a focus group or interviews?

**Interviews**
- Semi-structured, unstructured
- One on one
- Capture unique experiences for the individual
- May be easier for logistics
  - Phone
  - Less scheduling

**Focus Group**
- Capture more data with limited resources
- Includes collective discussion/group dynamic
- Focus more on social norms
- Average size 4-10 members
- Analyses is more difficult

Creating interview guides

1. Assemble expert panel
2. Brainstorm potential areas of influence
3. Refine areas based on research aim
4. Develop questions for each area
5. Obtain secondary review of questions
6. Pilot guides with initial interviews
7. Review transcripts and modify questions as needed—this can be done more than once
Interview Guides

- Ask open questions
- Use everyday vocabulary, don’t use technical words
- Put more sensitive questions towards the end
- Ask neutral questions. For example do not ask: ‘why haven’t you had your children immunized’ but rather ‘how did you decide whether or not to immunize your children’?
- Use concrete rather than abstract questions. For example ‘think about last time you were pregnant. What did you like about services then?’, rather than ‘what do you think about ante-natal services?’
- Use concrete events to help people remember

COREQ: Domain 3- Analysis & Findings

Data Analysis
- Number of data coders
- Description of coding tree
- Derivation of themes
- Software
  - NVivo, Atlas.TI
- Participant checking

Reporting
- Quotations presented
- Data and findings consistent
- Clarity of major themes
- Clarity of minor themes
Qualitative Analysis

1. Build rather than test theory
2. Use analytic tools for handling masses of raw data
   – Nvivo or Atlas-TI
3. Help analysts to consider alternative meanings
4. Be systematic and creative simultaneously
5. Identify, develop and relate the concepts that are the building blocks of theory

Coding Procedures

**Open coding:** Data are broken down into discrete events and given a name

– Conceptualizing: provide names to the descriptions within the data
– Categorizing: Combining concepts into broader categories
– Dimensions or patterns can be added
  • Positive or negative impact, frequency, etc.
Steps to coding

1. Read all the transcriptions carefully.
2. Pick one interview or document—and read through it asking yourself what it is about. Do not think about the “substance” of the information but its underlying meaning. Write thoughts in the margin.
3. After completing this task for several informants, make a list of all topics. Cluster together similar topics (e.g., place in same piles). Form topics into columns that might be arrayed as major topics, unique topics, and leftovers.
4. Take list of topics and go back to data to attach codes to quotes. USE SOFTWARE.
5. Continue to add codes
6. If necessary, recode your existing data.
7. Find the most descriptive wording for your topics and turn them into categories. Look for ways of reducing your total list of categories by grouping topics that relate to each other.
Open Coding example from MICU rehabilitation

- *I think the most important thing is having people who have a sense of commitment, who really have some sense of passion about wanting it to happen and wanting it to be successful, and are willing to commit themselves to working through the issues to make it work.*
Inter rater Reliability

- Double coding
- Identify and reconcile discrepancies
- Compare coding
  - Percent Agreement
  - Kappa

Data Saturation

- No new relevant knowledge obtained

<table>
<thead>
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<th>Nodes</th>
<th>FRQ</th>
<th>P01</th>
<th>P02</th>
<th>P03</th>
<th>P04</th>
<th>P05</th>
<th>P06</th>
<th>P07</th>
<th>P08</th>
<th>P11</th>
<th>P12</th>
<th>P13</th>
<th>P15</th>
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<td>not wanting to have CF</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>reliance on faith</td>
<td>5.00%</td>
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</tbody>
</table>
Physician Leadership example

• “But in terms of the doctor being part of it, yeah, huge. Depending on the attending that is here, you know some of them are very into the rehab perspective and they will have 3, 4 patients up and cycling and biking, and walking and doing all this stuff where some of them aren’t, that’s not their primary focus and so you’ll have maybe 1 or 2 patients who are able to do that stuff “

Content Analysis

Facilitators of MICU Rehab

Physician leadership

Team Buy-in

commitment
Passion
Work through issues
Rehab perspective
Primary focus
Getting patients
**Memo - Writing/ Categorizing**

1. After open coding, review themes and frequency of quotes.

2. Categorize and group main themes.
   - Look for similarities/contrasts
   - Do NOT only focus on most common themes
   - Quality over quantity

3. For each theme - review all quotes and write a memo or description of results.
   
4. Create table of results using exemplar quotes.

**Common Misperceptions**

- I have to quantify my themes (e.g., give frequencies) to get published in a medical journal.

- I have to quantify reliability (e.g., Kappa or percent agreement) to get published in a medical journal.

- Biased results are inevitable.
Qualitative Presentation

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
<th>Exemplar Quotes</th>
<th>Participant Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture: Buy-In</td>
<td>Staff needing to believe that rehabilitation is beneficial</td>
<td>In the beginning...there was some need for buy-in.</td>
<td>Nurse C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you get buy-in from all of the different disciplines, it's definitely easy.</td>
<td>Nurse C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you’re a rehab team who wants to do this and you don’t have buy-in by your nurses and physicians and respiratory, it’s not gonna happen.</td>
<td>Rehab</td>
</tr>
<tr>
<td>Interdisciplinary Team Communication</td>
<td>Need for cooperation and communication between different team members</td>
<td>Communication between the various teams is the most important thing for implementing a rehab program in critically ill patients because a lot of different teams and different individuals need to be involved.</td>
<td>Physician E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication and teamwork are probably the biggest things.</td>
<td>Physician C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You need to have some avenue for continued communication.</td>
<td>Rehab</td>
</tr>
<tr>
<td>Opinion Leader</td>
<td>Leader who advocates for early rehabilitation</td>
<td>DMN had a vision way before we actually started early mobilization.</td>
<td>Nurse A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patients are critically ill, so I think you kind of need always a leader who can guide you through potential situations... because I can't see how we can run the program without a leader who kind of oversees everything.</td>
<td>Program Coordinator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DMN spearheaded it from the get go and got myself and the rest of the leadership group of nurses on board.</td>
<td>Nurse D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I think if you don’t have leadership, you probably won’t have a program.</td>
<td>Physician D</td>
</tr>
</tbody>
</table>

What is Mixed Methods

Quantitative Data

Mixed Methods

Qualitative Data
Characteristics of Mixed Methods

1. Collect both qualitative and quantitative data
2. Analyze both Qual and Quan data
3. Rigorous procedures for both Qual and Quan analysis
4. Integrate both data sources
5. An approach to research that can include both theoretical orientations
   – Capitalize on strengths of both designs

Reasons for Mixed Methods Design

• Measurement development
• What program works with what group?
• Why did an intervention work?
• Are we measuring what we think we are measuring?
• What are appropriate and meaningful patient reported outcomes?
Convergent Design

Procedures:
- 50 participants complete survey
- Data analysis
  - Group comparisons
- Data analysis
  - Cross Tabulate
  - Qual and Quan data
- Use quotes to understand findings

Procedures:
- Same 50 participants complete interviews
- Thematic analysis
  - Open/axial coding

Procedures:
- Qual Data Collection
- Quan Data Analysis
- Merge Results
- Interpretation

Embedded Design

Figure 2. The data collection methods used in the current pain management study.
Note: QUAN = quantitative data collection; qual = qualitative data collection. Uppercase letters indicate primary priority; lowercase letters indicate secondary priority.
Identify “Positive Deviants”

Study using qualitative methods

Generate and test hypothesis quantitatively

Partner with stakeholders for dissemination

Hospitals in top/bottom 5% performance in RSMR (n =11)

In-depth interviews with key staff in AMI care (n =158)

Cross-sectional survey; n = 537, 91% response rate

National quality alliance to share and implement qual and quan data

Qualitative Findings

Table 4. Domains and Key Themes in Organizational Performance in 30-Day Risk-Standardized Mortality Rate for Patients With AMI

<table>
<thead>
<tr>
<th>Domain</th>
<th>Key Themes in High-Performing Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital practices and protocols to improve AMI care</td>
<td>Clinical guidelines and order sets, rapid-response teams and other risk-mitigation strategies, quality improvement committees, use of information technology, care management and discharge planning practices, hospitals, medication reconciliation practices, cardiac rehabilitation and support programs, patient and family education programs, coordination with pre- and posthospital providers, and participation in quality collaboratives and campaigns.</td>
</tr>
<tr>
<td>Organizational values and goals</td>
<td>Shared values to provide exceptional, high-quality care and alignment of quality and financial goals of the organization</td>
</tr>
<tr>
<td>Senior management involvement</td>
<td>Provision of adequate financial and nonfinancial resources, use of quality data in management decisions, and holding staff accountable for quality</td>
</tr>
<tr>
<td>Broad staff presence and expertise in AMI care</td>
<td>Sustained physician champions, empowered nurses, involved pharmacists, and high qualification standards for staff</td>
</tr>
<tr>
<td>Communication and coordination among groups</td>
<td>Diverse skills and roles, recognizing interdependencies, and smooth information flow among groups</td>
</tr>
<tr>
<td>Problem solving and learning</td>
<td>Adverse events as opportunities to learn, use of data for nonpunitive learning, innovation and creativity in trial and error, and learning from outside sources</td>
</tr>
</tbody>
</table>

Quantitative Finding

Table 3. Thirty-Day RSMR, by the Number of Key Strategies Used*

<table>
<thead>
<tr>
<th>Key Strategies Used, n</th>
<th>Hospitals (n = 537), n (%)</th>
<th>Mean 30-Day RSMR (95% CI)</th>
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<tbody>
<tr>
<td>0</td>
<td>15 (2.8)</td>
<td>15.9 (15.2 to 16.5)</td>
</tr>
<tr>
<td>1</td>
<td>191 (35.8)</td>
<td>16.0 (15.8 to 16.3)</td>
</tr>
<tr>
<td>2</td>
<td>189 (35.5)</td>
<td>15.7 (15.5 to 16.0)</td>
</tr>
<tr>
<td>3</td>
<td>101 (18.9)</td>
<td>15.2 (15.0 to 15.5)</td>
</tr>
<tr>
<td>4</td>
<td>31 (5.8)</td>
<td>15.2 (14.9 to 15.6)</td>
</tr>
<tr>
<td>5</td>
<td>6 (1.1)</td>
<td>14.3 (13.0 to 15.5)</td>
</tr>
</tbody>
</table>

RSMR = risk-standardized mortality rate
* Nonparametric test for trend: P < 0.001; key strategies are from the primary model of Table 2.

Common Misperceptions

- It’s not science if there aren’t a priori hypotheses.
- One should/shouldn’t start with an existing scientific theory or framework.
- Biased results are inevitable.
- The perceptions of so few, don’t represent the many.
- Qualitative research is not actionable.
- Only numbers persuade Decision Makers.
- Qualitative research- Anyone can do it!
Implications

• Qual/mixed methods can greatly inform implementation or QI projects
  – Develop theory/frameworks
  – Understand process
  – Can inform incremental changes
  – Based on small n

• Qual/mixed methods can be
  – Great first steps for research project development
  – Inform pilot study and understand results
  – Influence RCT design (e.g. measures, intervention)
Group project
• Each group will be assigned section of text
• Initially dissect using open coding
  – Ask questions
  – Label concepts
• Code concepts
  – Relate open coded concepts to each other
  – Create categories/subcategories as needed
  – Begin connecting concepts to each other