



Qualitative v. Quantitative Research:

Overview of Mixed-Methods Approaches

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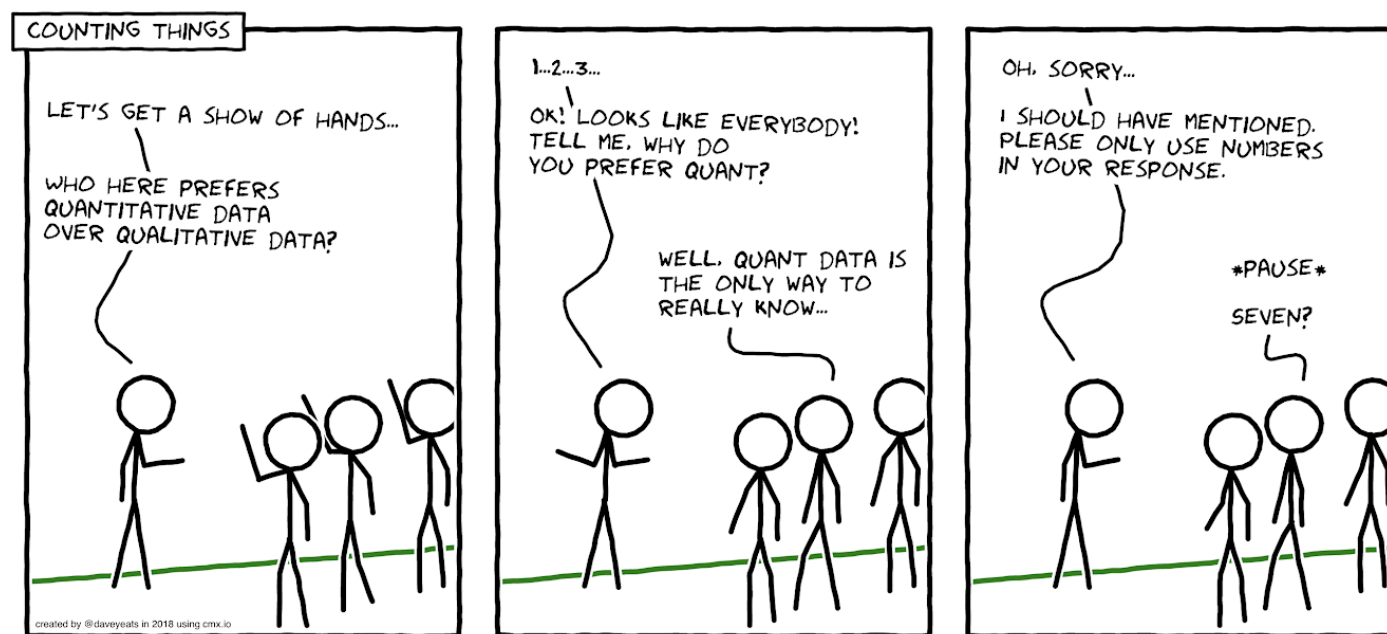
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Overview

- What is Qualitative Research?
- Qual & Quant research objectives
- Overview of Mixed-methods designs
- Examples of mixed-methods questions/aims



What is Qualitative Research?



The Epistemological Continuum

Epistemology: Way of creating knowledge to understand phenomena in the world



Positivism

- Every **justifiable assertion** can be scientifically verified or is capable of logical or mathematical proof
- Objective “Truth” exists and can be scientifically verified

Constructivism

- All reality is **socially constructed**
- People construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences



Perspectives along the continuum

	Positivism	Constructivism
Ontology (‘What is the nature of reality?’)	It is possible to capture external reality	There are multiple realities, and all are constructed
Epistemology (‘How can we understand phenomena about the world?’)	There is such a thing as an objective point of view	There is only such a thing as a subjective point of view that is co-created in interactions with other people or things
Axiology (‘What is the nature and role of values in research?’)	One can conduct value free inquiry	All inquiries are value bound



What is Qualitative Research?

- A set of methodologies involving an interpretive, naturalistic approach to subject matter
 - Inquiry process of understanding to interpret phenomena in terms of meanings people attach to them
 - To produce a holistic, complex description of social/human phenomena and lived experience
 - Researchers study phenomena in natural settings
 - Involves multiple data collection methods and analytic strategies

Data output is unstructured TEXT, which is systematically analyzed to identify THEMES



What is Qualitative Research?

- Qualitative research is a *process of understanding* based on *distinct methodological traditions of inquiry that explore a social or human problem*. The researcher builds a complex, *holistic* picture, *analyzes words*, reports *detailed views of informants*, and conducts the study in a *natural setting*.

- Creswell. *Qualitative inquiry and research design*



Types of Research Questions

Quantitative Research Questions

- Descriptive ('What is the proportion...?')
- Test relationships ('Is there an association between...?')
- Comparative ('Is there a difference between...?')

Qualitative Research Questions

- Descriptive ('What are the values and beliefs...?')
- Exploratory ('How are X and Y related...?')
- Explanatory ('Why is there a difference...?')



Question Examples

- Topic: Use of 'NCCN Harmonized Guidelines for Sub-Saharan Africa' for breast cancer in Nigeria
- Original Question:
 - Do healthcare providers in Nigeria provide guideline-concordant care?
 - Broad
 - Ambiguous
 - Difficult to operationalize through qualitative or quantitative investigation



Improving our question

- Do healthcare providers (HCPs) in Nigeria provide guideline-concordant care?

Quantitative Questions

What is the prevalence of NCCN guideline usage among HCPs practicing in tertiary care centers in Nigeria?

What are the individual and institutional factors that predict NCCN guideline adherence in Nigeria?

What is the association between fellowship training and NCCN guideline usage in Nigeria?

Qualitative Questions

What are the barriers and facilitators of NCCN guideline usage among HCPs practicing in tertiary care centers in Nigeria?

How do HCPs in Nigeria use NCCN guidelines to inform their clinical practice?

Why do HCPs in Nigeria report [XYZ attitudes] toward guideline usage?



Qualitative Research Inquiry

•“What”
Questions:
descriptive

What are the attitudes and beliefs of X population?

•“How”
Questions:
process

How do people construct beliefs?

•“Why”
Questions:
contextualize

Why do they think, feel, and act the way they do?

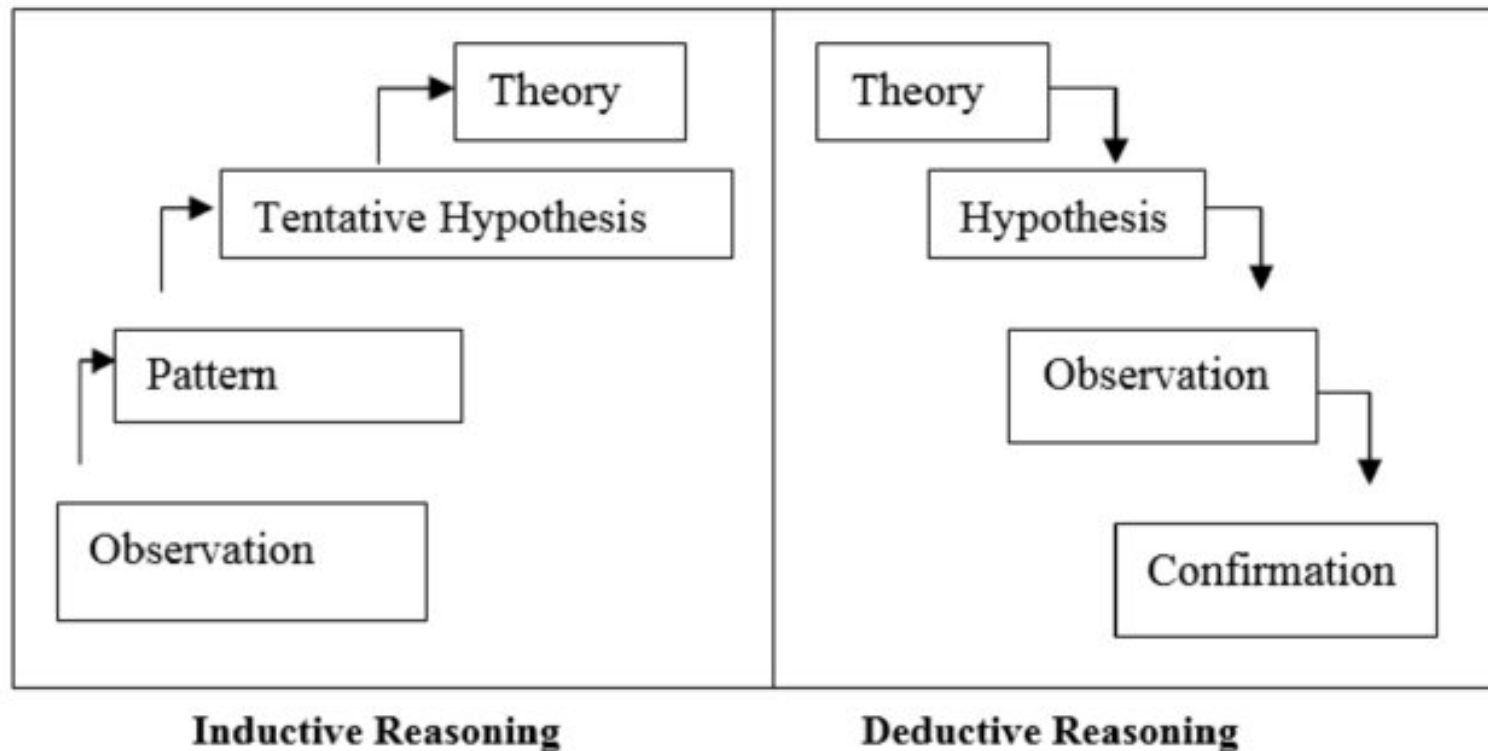


When to Integrate Qualitative Research Questions

- When little known about a topic
 - ✓ Allows identification of new phenomena
 - ✓ Hypothesis-generating: uncover findings for further investigation in large-scale trials
 - ✓ Provides guidance for the development of novel interventions
- Pursuing a topic of sensitivity and emotional depth
 - ✓ Reveals information that may not be identified through pre-determined survey questions
- Wish to understand lived experience
 - ✓ Contextual understanding participants' beliefs and motivations
- You have done quantitative work, but questions remain
 - ✓ Wish to get inside “black box” of practice, programs, interventions
 - ✓ Can provide a deeper understanding of processes/ mechanisms



Exploratory and Evaluative



Quantitative Methods



Qualitative Methods



Overview of Mixed-Methods Research Designs



What are Mixed-Methods?

- It is the **intentional** process by which a researcher brings qualitative and quantitative approaches together in a study
- **Integration** is the distinguishing feature of mixed-methods designs.
- Generates inferences **beyond** what either approach alone could generate

Objectives of Mixed-Methods Designs

Triangulation

- Seeks **convergence or corroboration** of findings using different methods to examine the **same phenomenon**

Complement

- Seeks **elaboration, clarification, enhancement**, increased understanding of results from one method using the other

Development

- Uses results from one method to inform **design** of another method

Expansion

- Enhances breadth of study by using **different methods** to answer **different research** questions



Core Mixed-Methods Designs

- **Concurrent**
 - Convergent design
 - Embedded/ nested design
- **Sequential**
 - Exploratory
 - Explanatory

Consider **intent** of the project when selecting a design:

- What outcome (objective) do you hope to attain by ‘mixing’ the two data sources? (e.g., Triangulation, Development, Expansion?)



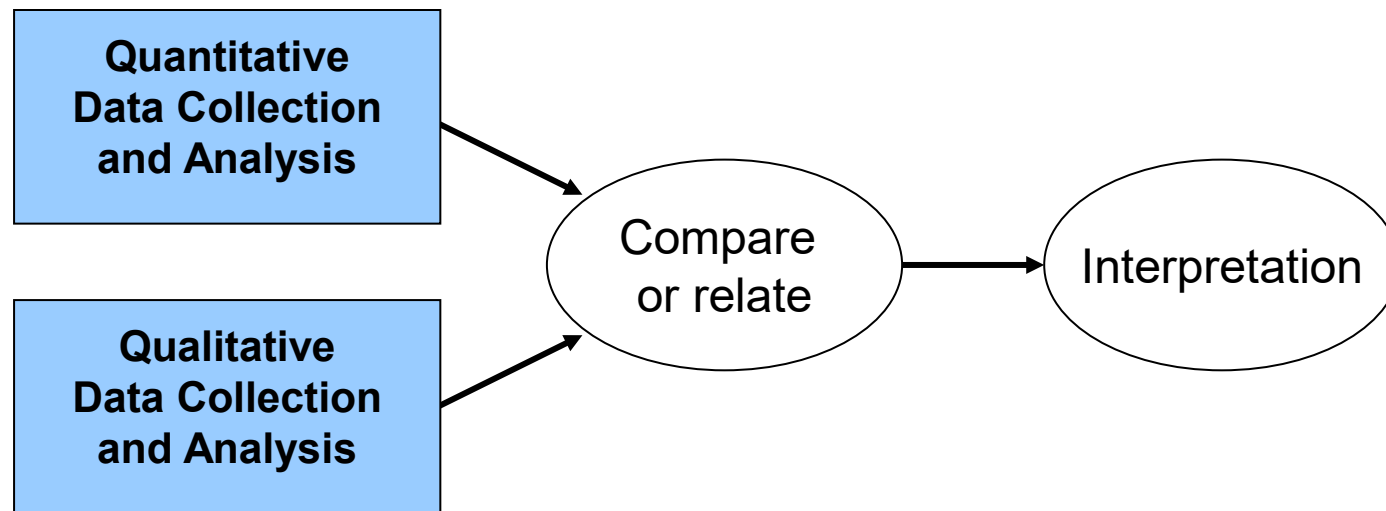
Mixed-methods notation

- Notation systems help us draw diagrams of design
- QUANT + QUAL = converge results
- QUAL → quant = explore and generalize findings
- QUANT → qual = explain quantitative results



Convergent Design

- QUANT + QUAL
- Qualitative and Quantitative data collection occur concurrently, but **separately** from one another, analyzed separately, and **compared**.



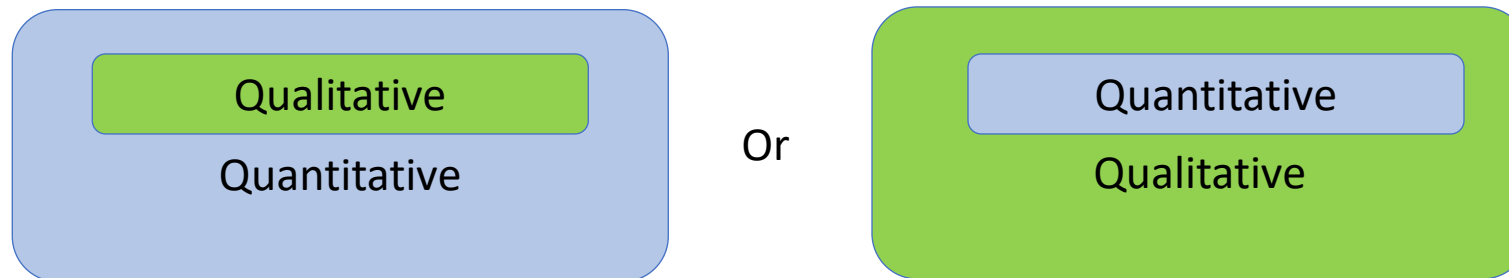
Convergent Design

- Basic Procedures:
 - Collect both qualitative and quantitative data about the topic
 - Analyze the two sets separately
 - Merge the two datasets
 - Interpret how the two sets converge, diverge, relate, or combine
- Intent of the Convergent Design:
 - Obtain a more complete understanding from two databases
 - Corroborate results from different methods
 - Compare multiple levels within a system



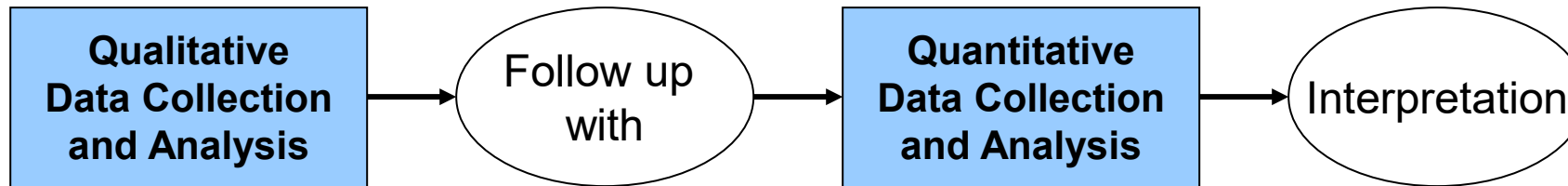
Embedded/ Nested Design

- A type of concurrent design: **QUANT + qual** or **QUAL + quant**
- A small amount of either qualitative or quantitative data are included **within** a larger qualitative or quantitative study
- Data are often gathered from the **same participants**
- Example: purposively sampling participants for semi-structured interview within a larger quantitative survey



Exploratory Sequential Design

- QUAL → quant
- Qualitative methods are used to inform a subsequent quantitative study
 - Data are often gathered with the goal of generating insights to **inform** the design of a quantitative survey or intervention that will be evaluated quantitatively



Exploratory Sequential Design

- **Basic Procedures**

- Starts with the collection and analysis of qualitative data to explore a phenomenon
- Identify the results to build a quantitative feature
 - Develop an instrument, identify variables, or design intervention
- Implement the quantitative strand
- Interpret - generalize or extend the initial qualitative findings

- **Two Points of Integration**

- 1) Use qualitative results to build a new quantitative feature
 - Decide what aspect to build on and nature of what to build
- 2) After quantitative phase, draw integrated conclusions

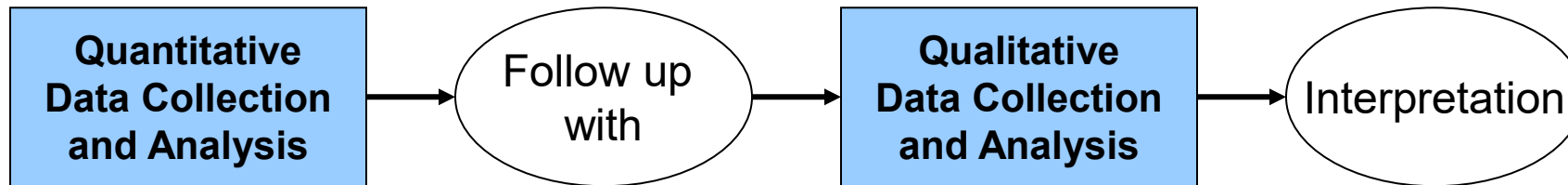
- **Intent of Exploratory Sequential Design**

- Results of the first, qualitative phase, inform the second quantitative phase
- Develop and apply a quantitative measures, survey, intervention, digital tool, or variable
- First explore because measures variables, theories are not known
- Assess transferability of qualitative themes to different groups



Explanatory Sequential Design

- QUANT → qual
- Uses qualitative methods to understand **earlier** quantitative findings
- Quantitative data collected and analyzed first.
 - Results help plan the qualitative phase, i.e. what questions need to be further probed, **who** to interview to gain insight into the quantitative results.



Explanatory Sequential Design

- **Basic Procedures**

- First, design and implement quantitative phase
- Connects to second phase – point of integration
- Develop qualitative research questions, plan sampling and data collection
- Implement qualitative phase
- Interpret how qualitative results explain and add insight

- **Two Points of Integration**

- Occurs between quant analysis in first phase and qual data collection in second phase
- When qual phase is complete, determine how qual results help explain and extend specific quant results

- **Intent of Explanatory Sequential Design**

- To use a qualitative strand to help explain initial quantitative results
- Used to explain
 - Significant or nonsignificant results, exemplars, outliers, surprising or confusing results
 - Mechanisms
- To guide purposeful sampling for a qualitative phase



Final Tips for Mixed Methods Designs



What is NOT considered a mixed-methods design?

- **Not** all study designs with qualitative and quantitative data elements can be considered “mixed methods”!!
- For example:
 - ⊖ A study consisting of 30 in-depth interviews, where participants also fill out a demographic survey.
 - ⊖ A survey sent to 500 patients that includes 1-2 questions at the end for open-ended feedback.



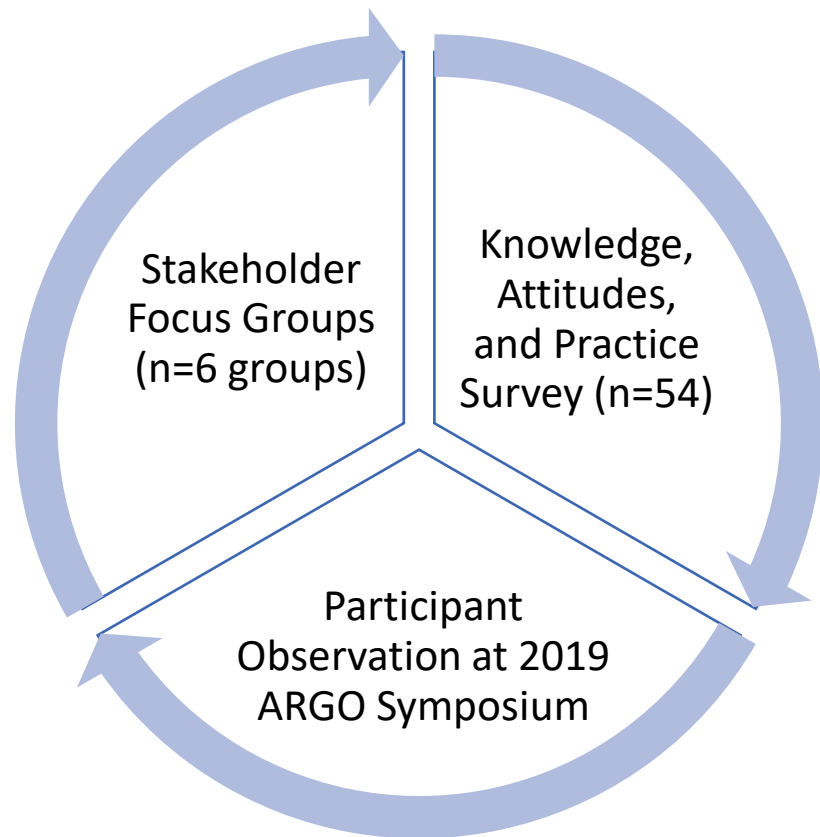
Remember, mixed-methods designs must be...

- **Intentional:** The qualitative and quantitative methods must contribute **distinct** sets of data to help you answer your research questions.
 - *Why* did you choose each method?
- **Integrated:** Each method is used to enhance and explore aspects of your aims that you would **not** be able to answer using either quantitative or qualitative alone.
 - *How* can each method help you address your aims?
 - Are the Quant/qual aspects meaningfully related?



Mixed-Method Example

- **What** are clinician attitudes, needs, and preferences for a mHealth-based ultrasound-guided biopsy training program in Nigeria?
- **How** do multidisciplinary stakeholders navigate practice-specific challenges to breast cancer diagnosis?



> [JCO Glob Oncol.](#) 2020 Nov;6:1813-1823. doi: 10.1200/GO.20.00353.

Multistakeholder Needs Assessment to Inform the Development of an mHealth-Based Ultrasound-Guided Breast Biopsy Training Program in Nigeria

Kathleen A Lynch¹, Adeleye D Omisore², Thomas M Atkinson¹, Olusola C Famurewa², Jacqueline A Vera¹, T Peter Kingham³, Olusegun I Alatise⁴, Hedvig Hricak⁵, Elizabeth A Morris⁵, Elizabeth J Sutton⁵; the African Research Group for Oncology Collaborative



Data Analysis

- **Stage 1: Separate Analyses**

- Quant: Domains of the needs assessment were analyzed descriptively.
 - Frequencies were calculated for categorical data; means, medians, standard deviations, and ranges were calculated for continuous data and Likert-type scale items.
- Qual: Focus group recordings were transcribed verbatim for analysis. All fieldnotes and focus group transcripts were analyzed according to an inductive thematic content analysis approach (Creswell & Poth, 2017).

- **Stage 2: Merged Analyses**

- The focus group themes were summarized and merged with trends from the survey data and key participant observation findings in a joint display.
- We compared the three data sources side by side to identify common themes across the dataset.
 - Each row of the table listed common domains of the KAP survey and focus group guide (e.g., current practices, challenges, attitudes toward ultrasound-guided breast biopsy, training program considerations)
 - Each column contained corresponding findings (e.g., themes, summary statistics) from each data source.
- After constructing the table, the analysis team met to achieve consensus on the 5 major themes across each domain, supported by the three data sources.



Further Reading

- Barroga, E., & Matanguihan, G. J. (2022). A practical guide to writing quantitative and qualitative research questions and hypotheses in scholarly articles. *Journal of Korean medical science*, 37(16).
<https://doi.org/10.3346/jkms.2022.37.e121>
- Lynch, K. A., Omisore, A. D., Famurewa, O., Olasehinde, O., Odujoko, O., Vera, J., Kingham, T. P., Alatise, O. I., Egberongbe, A. A., Morris, E. A., Atkinson, T. M., & Sutton, E. J. (2021). Designing Participatory Needs Assessments to Support Global Health Interventions in Time-Limited Settings: A Case Study From Nigeria. *International Journal of Qualitative Methods*, 20. <https://doi.org/10.1177/16094069211002421>





Thank you!

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