McMaster University

Family Medicine

David Braley Primary Care Research Collaborative

@McMasterFamMed

Introduction to Mixed Methods Research and Applications in Primary Care

[Watch a recording of this session]

Jennifer Salerno, PhD, MSc, Research Associate, Dept Family Medicine

Jessica Gaber, MSW, RSW, Research Coordinator, Dept Family Medicine

November 25th, 2025

Michael G. DeGroote SCHOOL OF MEDICINE

Objectives

- Describe the core characteristics of mixed methods research
- Distinguish between quantitative, qualitative, and mixed methods research
- Introduce the three basic typologies used in mixed methods research
- Provide primary care examples: Jennifer, Jessica

The Nature of Mixed Methods Research

- "*An intuitive way of doing research that is constantly being displayed through our everyday lives*"
- Bringing together both statistical trends ***and*** stories of personal journeys

Creswell & Plano Clark. Designing and Conducting Mixed Methods Research, 2nd Edition, 2011.

Core Characteristics

- ✓ Collects and analyzes both qualitative and quantitative data rigorously based on research questions
- ✓ Mixes (or integrates or links) the two forms of data:
  - ✓ concurrently by combining (or merging)
  - ✓ sequentially by having one build on the other, or connecting the two
  - ✓ embedding one within the other
- ✓ Gives priority to one or both forms of data (in terms of what the research emphasizes)
- ✓ Frames these procedures within theory and philosophy
- ✓ Organizes these procedures into specific research designs that provide the plan for conducting the study

Research & the Research Question

- "*Systematic activity designed to contribute to generalizable knowledge*"
- Improve current clinical practice to achieve the desired outcomes
- Driver that "*determines the research architecture, strategy, and process*"
  - Find a solution to the clinical problem…
  - Formula for the successful search for answers…
  - Enhances clarity of the thought process…
  - FINER, PICO, EPPiC…

Moisey L et al (2021). Advancing qualitative health research approaches in applied nutrition research. J Hum Nutr Diet. Thabane L et al (2009). Posing the research question: Not so simple. Can J Anesthesia.

Mixed Methods Research Questions

- Call for real-life contextual understandings, multi-level perspectives, and cultural influences
- Siloed QUANT or QUAL approach is inadequate to address research problem
- Fit between mixed methods research and the research question

Creswell J et al (2011). Best Practices for Mixed Methods Research in the Health Sciences. National Institutes of Health.

Rationale for Using Mixed Methods Research

- One data source may be insufficient
- Results need to be explained
- Exploratory findings need to generalized
- A second method is needed to enhance a primary method
- Develop multiple perspectives
- More complete understanding
- Study complex phenomena or constructs
- Contextualize information

- Only 31% of proposals provide a rationale

Creswell & Plano Clark. Designing and Conducting Mixed Methods Research, 2nd Edition, 2011.
O'Cathain A et al (2008). The quality of mixed methods studies in health services research. J Health Serv Res Policy.

Bringing Together of Qualitative and Quantitative

Qualitative

- Quality and depth of phenomenon
- Generate hypothesis
- Natural setting
- Purposeful sampling
- Iterative, textual data
- Themes
- Conceptual models
- Taxonomies

Quantitative

- Quantity and breadth of phenomenon
- Test hypotheses
- Experimental setting
- Random sampling
- Descriptive or analytical
- Numeric data
- Statistical significance
- Measure of association

Curry L, Nunez-Smith M. Mixed Methods in Health Sciences Research, 2017.
Poth C. What Can Mixed Methods Offer Health Researchers. McMaster MERIT Rounds, May 16th, 2023.

Advantages and Disadvantages

Qualitative

- Detailed perspectives, built up from a small sample of participants
- Directly hear the voices of participants
- People like stories…

BUT…

- Limited generalizability and open to bias / highly interpretive

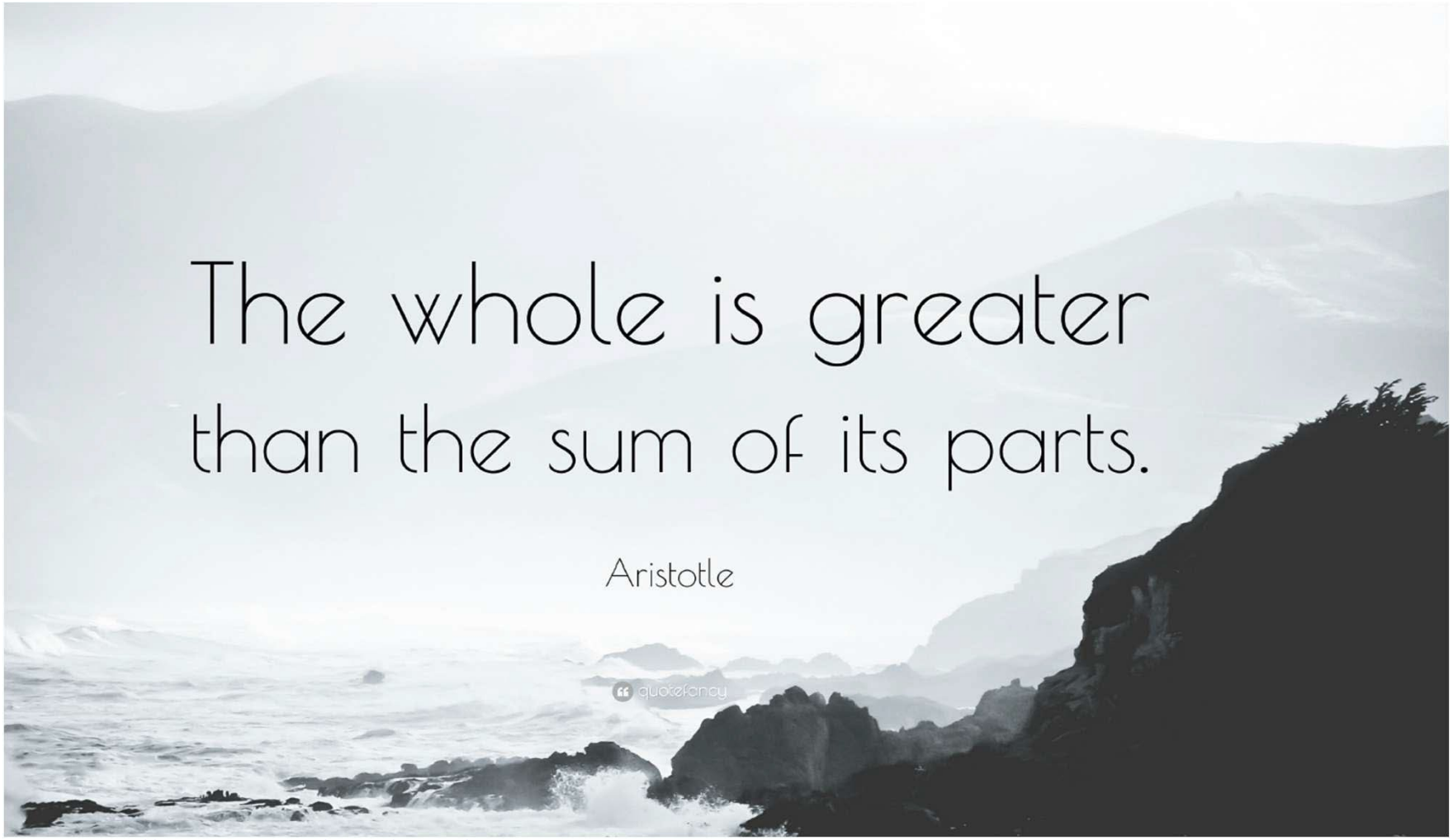
Quantitative

- Inferences from a large study sample
- Demonstrate relationships, cause-effect, control for bias using statistical procedures
- People like numbers…

BUT…

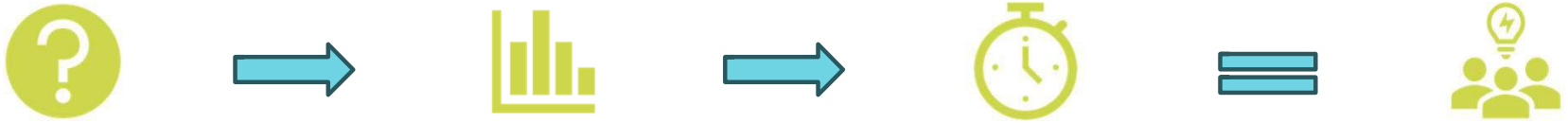
- Limited understanding of context and participants in-depth

Creswell J. What is Mixed Methods Research. YouTube video. McMaster SPARK, 2013.



From: https://quotefancy.com/quote/19579/Aristotle-The-whole-is-greater-than-the-sum-of-its-parts.

Overview of Mixed Methods Research



Research Question

Complex phenomena

Deliberate, *a priori* conceptualization

Framing as a single, unified study

Deliberate Integration

Generates new insights

Specifies how qualitative and quantitative components will come together

Fit of Components

Relevant timing of each qualitative and quantitative component follows naturally

Value

Insights generated are greater than what could have been achieved using individual designs

Curry L, Nunez-Smith M. Mixed Methods in Health Sciences Research, 2017.

Family Medicine
David Braley Primary Care Research Collaborative
McMaster University

Bringing Together of Qualitative and Quantitative

Philosophical Debate

- Beliefs and assumptions about knowledge that informs a study, guides inquiries
- Paradigms: philosophical orientation to research
- Natural tension for researchers of different backgrounds when combining approaches in mixed methods designs

Table 1. Four Worldviews Useful to Informing Mixed Methods Research

Postpositivist Worldview	Constructivist Worldview	Transformative Worldview	Pragmatist Worldview
Determination	Understanding	Political and activist	Consequences of actions
Reductionism	Multiple participant meanings	Empowerment, human rights, social justice oriented	Problem centered
Empirical observation and measurement	Social and historical construction	Collaborative	Pluralistic
Theory verification	Theory generation	Change, emancipatory oriented	Real-world practice oriented

Creswell J et al (2011). Best Practices for Mixed Methods Research in the Health Sciences. National Institutes of Health.
Sandelowski M (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. Res Nurs Health.

Positive Outlook

- Opportunity for new knowledge
- Diverse philosophical positions
  - Single stance
  - Dialectal stance
  - Pragmatism is typically associated with mixed methods research
- Acknowledge, identify assumptions, and how relates to the research

Creswell, Plano & Clark, 2018.

Table 2. Elements of Worldviews and Implications for Practice

Philosophical Question	Postpositivism	Constructivism	Transformative	Pragmatism
Ontology (What is the nature of reality?)	Singular reality (e.g., researchers reject or fail to reject hypotheses)	Multiple realities (e.g., researchers provide quotes to illustrate different perspectives)	Multifaceted and based on different social and cultural positions (e.g., researchers recognize different power positionalities in our society)	Singular and multiple realities (e.g., researchers test hypotheses and provide multiple perspectives)
Epistemology (What is the relationship between the researcher and that being researched?)	Distance and impartiality (e.g., researchers objectively collect data on instruments)	Closeness and subjectivity (e.g., researchers visit with participants at their sites to collect data)	Collaboration (e.g., researchers actively involve participants as collaborators, build trust, and honor participant standpoints)	Practicality (e.g., researchers collect data by "what works" to address research question)
Axiology (What is the role of values?)	Unbiased (e.g., researchers use checks to eliminate bias)	Biased (e.g., researchers actively talk about and use their personal biases and interpretations)	Based on human rights and social justice for all (e.g., researchers begin with and advocate for this premise)	Multiple stances (e.g., researchers include both biased and unbiased perspectives)
Methodology (What is the process of research?)	Deductive (e.g., researchers test an a priori theory)	Inductive (e.g., researchers start with participants' views and build "up" to patterns, theories, and interpretations)	Participatory (e.g., researchers involve participants in all stages of the research and engage in cyclical reviews of results)	Combining (e.g., researchers collect both quantitative and qualitative data and mix them)
Rhetoric (What is the language of research?)	Formal style (e.g., researchers use agreed-upon definitions of variables)	Informal style (e.g., researchers write in a literary, informal style)	Advocacy, activist-oriented (e.g., researchers use language that will help bring about change and advocate for human rights and social justice)	Formal or informal (e.g., researchers may employ both formal and informal styles of writing)

Typology of Research Designs

- Classification scheme
  - Suits introductory audiences
    - Experts: interactive or dynamic approaches
  - Provides a range of available options, design choices
  - Focuses on data collection and analysis, and point of ***integration*** of qualitative and quantitative components
  - Shifts the conceptualization from timing or sequence to ***primary purpose or intent of the design***

Creswell, Plano & Clark, 2018.

Three Core Designs

First word in design name:

- To *explain*
- To *explore*
- To *converge*

- Match research problem and rationale

- Provides an organizing logic and framework

TABLE 3.2 ■ Our Changing Typologies

Our 2003 Typology (Creswell, Plano Clark, Gutmann, & Hanson, 2003)	Our 2007 Typology (Creswell & Plano Clark, 2007)	Our 2011 Typology (Creswell & Plano Clark, 2011)	Our Present Typology of Core Designs
Sequential explanatory	Explanatory design	Explanatory sequential design	Explanatory sequential design
Sequential exploratory	Exploratory design	Exploratory sequential design	Exploratory sequential design
Sequential transformative		Transformative design	
Concurrent triangulation	Triangulation design	Convergent parallel design	Convergent design
Concurrent nested	Embedded design	Embedded design	
Concurrent transformative		Transformative design	
		Multiphase design	

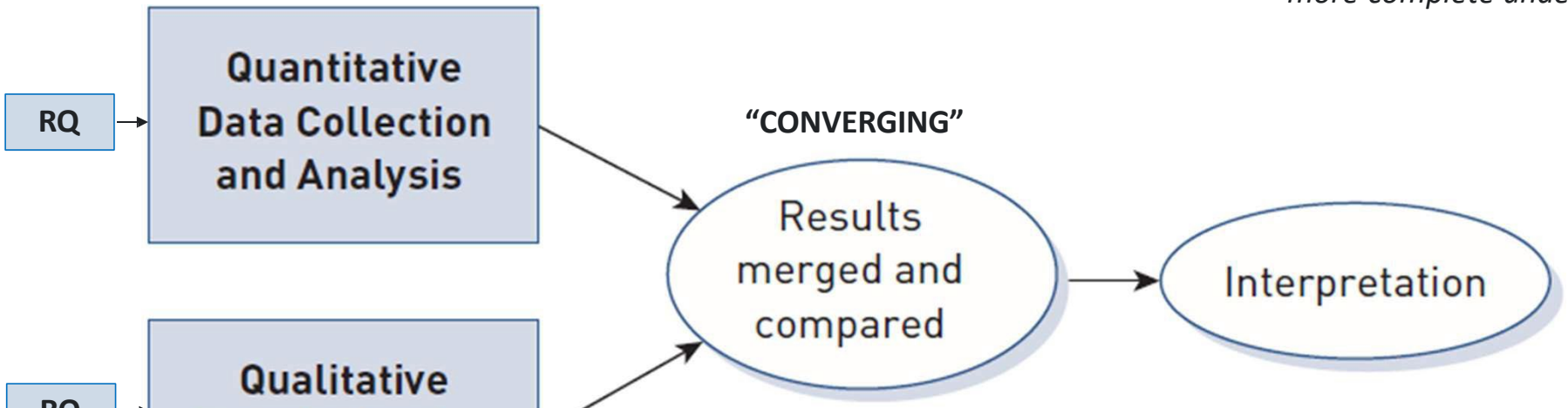
Creswell, Plano & Clark, 2018.

Convergent Design

Most popular

Primary intent: to obtain different but complementary data on the same topic

"more complete understanding"



- Use strategies to merge the two sets of results:
  - Narrative weaving of main findings of each e.g., comparative synthesis
  - Joint displays e.g., side-by-side table, transform

- Summarize and interpret
- Discuss to what extent and in which ways: relate, converge, diverge, combine
- Meta-inferences e.g., writing a narrative

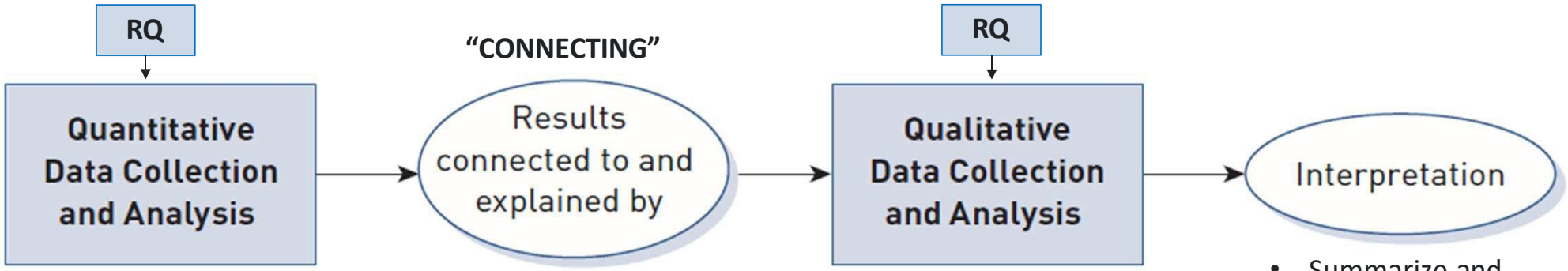
Creswell, Plano & Clark, 2018.

Explanatory Sequential Design

Most straightforward

Primary intent: to use a qualitative component to explain initial quantitative results

"expand understanding"



- Summarize and interpret
- Inform qualitative follow up study
- Refine qualitative questions or protocol

- Summarize and interpret
- Discuss to what extent and in what ways the qual explains quant
- Meta-inferences e.g., writing a narrative

Creswell, Plano & Clark, 2018.

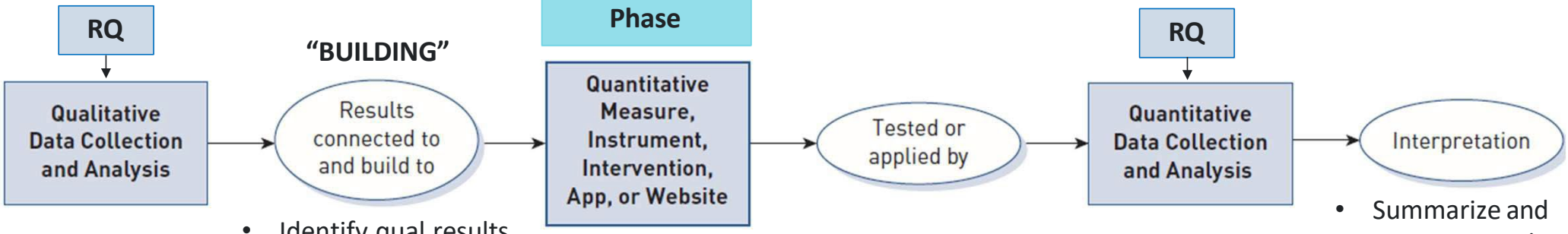
Family Medicine
David Braley Primary Care Research Collaborative
McMaster University

Exploratory Sequential Design

Exploring before development

Primary intent: use initial results of qualitative component to inform quantitative component

"develop instrument, generalize"



- Identify qual results on which the quant will be built

- Summarize and interpret in what ways and to what extent the quant results extend the qual
- Meta-inferences e.g., writing a narrative

Creswell, Plano & Clark, 2018.

Family Medicine
David Braley Primary Care Research Collaborative
McMaster University

How to Choose a Design?

- Intent for mixing, which differ among the three designs
  - *Converging? Connecting? Building?*
- Other considerations:
  - Researcher's familiarity with the designs
  - Expertise needed
  - Time available
  - Complexity of the design
    - Convergent and Exploratory are more complex than the Explanatory

Rigor in the Study Designs

Qualitative

- Research question(s)
- Identify the participants e.g., data saturation, purposeful sampling
- Use interview or focus group guide and questions
- Use qualitative analysis approaches

Quantitative

- Research question(s)
- Identify the participants e.g., convenience, random sampling
- Used validated data collection instruments
- Use descriptive statistics, inferential statistics, calculate effect sizes

Best Practices in Mixed Methods Research

- GRAMMS: Good Reporting of A Mixed Methods Study

Box 1 Good Reporting of A Mixed Methods Study (GRAMMS)

(1) Describe the justification for using a mixed methods approach to the research question
(2) Describe the design in terms of the purpose, priority and sequence of methods
(3) Describe each method in terms of sampling, data collection and analysis
(4) Describe where integration has occurred, how it has occurred and who has participated in it
(5) Describe any limitation of one method associated with the present of the other method
(6) Describe any insights gained from mixing or integrating methods

Revising and elaborating for GRAMMS 2.0

O'Cathain et al (2008). The quality of mixed methods studies in health services research. J Health Serv Res Policy. MERIT-PSI Research Event, 2025.

Best Practices in Mixed Methods Research

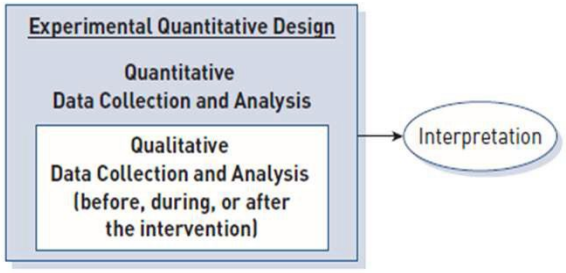
- Templates, purpose statements, coded language for different designs
- Explicit about the design: “rules by which to judge”
- Poorly executed quantitative and qualitative components impairs integration and may miss important mechanisms, processes, or contextual nuances –> mixed methods study are meant to uncover
- May fail to inform meaningful context-sensitive recommendations for practice, policy or education

Helpful Resources

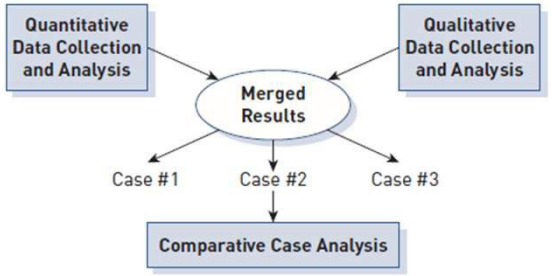
- Visual joint displays: *Guetterman et al., 2021*
- Qualitative tip sheets: *Public Health Nursing Practice*
- McMaster Summer Institute, S Jack (SON) and team, June 1-4, 2026, CPD Office
- More reading: *Cheryl Poth*, *Elizabeth Creamer*
- Journal of Mixed Methods Research
- Mixed Methods International Research Association (*MMIRA*)

Complex Mixed Methods Designs: Core Design +

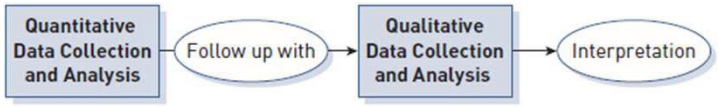
Intervention Trial



Methodology



Theoretical Framework



Mixed Methods Experimental Design

✓Quant is the primary design (*effectiveness*)
✓Qual is embedded (*implementation*)

Mixed Methods Case Study Design

✓Overall guiding approach
✓Conceptual level

Mixed Methods Participatory-Social Justice Design

✓Formalized set of assumptions
✓Guides design and conduct

Example CIHR Grant Proposal: Eating Disorders

McMaster University

- EDs pose significant medical risks, early and timely access to care is critical
- Many individual and health-system barriers e.g., long wait times
- Ontario's ED Quality Standard: clear role of family physicians
  - Lack of knowledge, confidence, stress, education gap
- Partnership: Body Brave
  - Patient recovery and care, education and training, self-guided resources and tools
  - Level of Care Self-Assessment Tool (LoCSA)
  - Recovery Support Program (RSP)

BODY BRAVE

3,500+
People served annually

1,600+
Hours of support provided in 2024

1,500+
Professionals and Students trained

https://www.bodybrave.ca/

RESEARCH Open Access

Challenges in eating disorder diagnosis and management among family physicians and trainees: a qualitative study

Angel Tse[1], Sabatinie Xavier[2], Karen Trollope-Kumar[3,4], Gina Agarwal[3] and Cynthia Lokker[5*]

Finding The Right Level of Care

Recovery At Scale

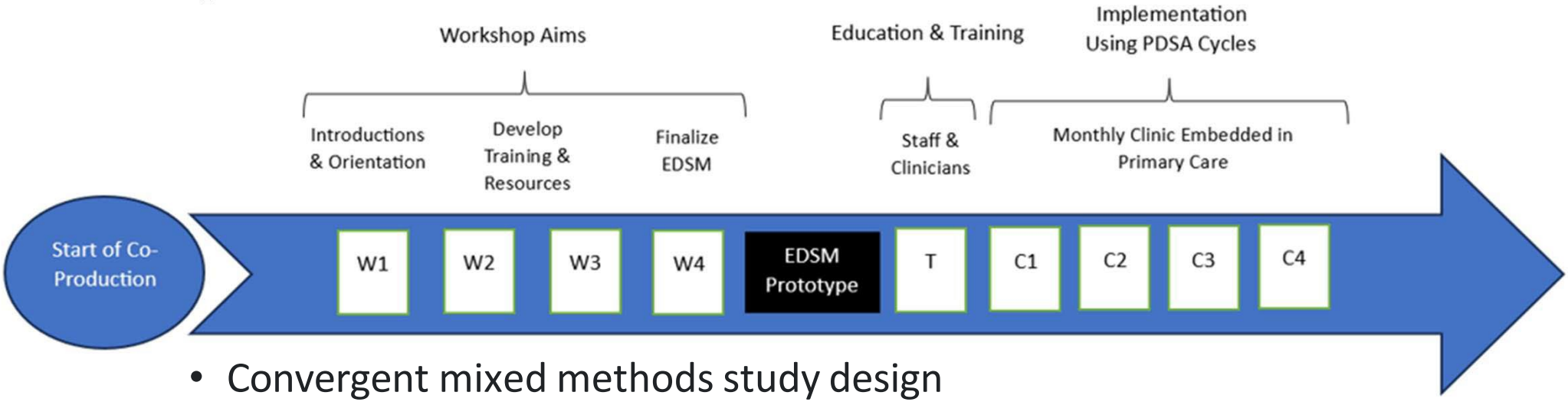
Body Brave's Recovery Support Program

Team Acknowledgements

- Morgan Black
- Karen Trollope-Kumar
- Rohini Kumar
- Sonia Kumar
- Keely Phillips
- Jeannine Smith
- Michelle Howard
- Jennifer Salerno
- Jill Berridge
- Bethany Elliott
- Janet Noble
- Doug Oliver
- Darcy Waisman
- Blake Woodside

Family Medicine
David Braley Primary Care Research Collaborative
McMaster University

Develop an Eating Disorder Support Model (EDSM) in Primary Care



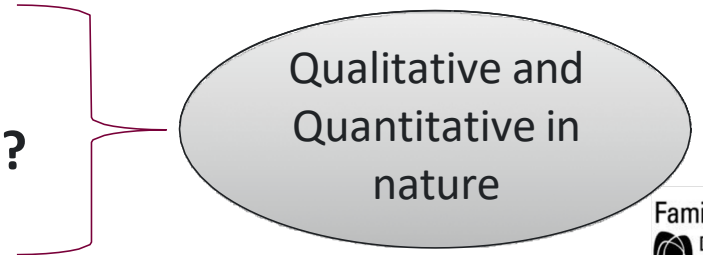
- Convergent mixed methods study design
- Co-production approach
- Quality improvement (e.g., Plan-Do-Study-Act)
- Implementation theory (e.g., Normalisation Process Theory, NPT)

Abbreviations: C, embedded EDSM clinic; EDSM, Eating Disorder Support Model; PDSA, Plan-Do-Study-Act; T, training; W, workshop.

Research Questions

1. Using a co-production approach within a community partnership, what are the Body Brave programmatic components and processes that need to be adapted and refined to promote practice change and implementation of a new EDSM in primary care?

2. What are the evaluative impacts on primary care providers, administrators, people with lived experience, and Body Brave partners when using a co-production approach to develop a new model of care for eating disorders in primary care?
    - **Implementation processes?**
    - **Primary care context?**
    - **Focus on patient perspectives?**
    - **Co-production experiences?**



Research Questions

a. What are the ***experiences of primary care providers*** and administrators who participated in training and implementation of the new EDSM?

b. What are the ***experiences of patients*** receiving care through the new EDSM?

c. What evidence exists that the new EDSM will become ***part of routine practice by primary care providers and administrators***?

d. What is the ***experience of the co-production team*** in adapting and refining the EDSM using iterative quality improvement cycles?

The Plan: Convergent Mixed Methods Research Study

Data Collection	Analysis	Results	Interpretation
Qualitative □ feedback from co-production workshops & training □ field notes from Clinical Champions after monthly clinics □ feedback from monthly clinic outreach □ semi-structured interviews with ED patients □ RQ + 4 Co-Pro	**Qualitative** □ qualitative analytic procedures □ Normalization Process Theory	Merging of the two datasets Compare the results in a table or narratively Main findings in each	Summarize and interpret Discuss to what extent and in which ways: relate, converge, diverge, combine Meta-inferences e.g., writing a narrative
Quantitative □ roles and years of experience of PCPs □ NoMAD survey of PCPs □ RQ + 4 Co-Pro	**Quantitative** □ descriptive analysis □ Normalization Process Theory		

NoMAD, Normalization Measurement Development questionnaire; PCPs, primary care providers; RQ +4 Co-Pro, Research Quality Plus for Co-Production Framework and Assessment Instrument.

Example: Understanding the Impacts & Outcomes of Volunteering with Health TAPESTRY on Volunteers

- **Health TAPESTRY:** volunteers, tech, system navigation, and primary care teams to help older adults stay healthier for longer
- ***Impacts of volunteering on volunteers*** - well established in the lit, but not between age groups or about impacts of specific programs
- **Objective:** to understand how volunteering with Health TAPESTRY impacted volunteers, with outcomes including healthy behaviours, psychological and social factors, and opportunities and learning experiences

Gaber, J., Parascandalo, F., Di Pelino, S., Datta, J., Lamarche, L., Begum, H., ... & Mangin, D. (2025). Exploring the effects of community-based volunteering to support older adults on volunteers: A mixed methods study in Ontario, Canada. *Evaluation and Program Planning*, 102617.

Family Medicine
David Braley Primary Care Research Collaborative
McMaster University

The Plan: Convergent Mixed Methods Research Study

Data Collection	Analysis	Results & Interpretation
Qualitative • Focus groups /interviews • Volunteer-written narratives	**Qualitative** • Thematic analysis at a semantic level	• Mapping key impact/outcome themes from FGs/interviews onto data from narratives and surveys • Quantifying qual results (counting impacts & outcomes at an individual level) to make qual and quan comparable • This made it possible to order the findings form most to least common
Quantitative • Surveys: IPAQ, Basic Empathy Scale, EQ-5D, UCLA Geriatric Attitudes Scale, Volunteering Outcomes Scale	**Quantitative** • Descriptive statistics • Pre/post changes using paired t-tests	

Theme	Salient Quote
Opportunity to meet new people, see new places, and learn the community	"I found I could have stayed there for hours and listened to her telling me all about the place" (V18, 72 years female)
Planning for healthy behaviour change	"I was able to reflect on my own health when the client reflected in his health goals" (V3, 19 years female)
Improved communication and people skills	"I'm just more comfortable now talking to people. I've always liked talking to people, but like I think asking like some of the tougher questions and like truly digging into like health issues has helped me understand more and empathize more towards people" (V4, 29 years, female)
Learning about older adults, their needs, and potential health conditions	"As a team we have been gaining insight on how seniors are coping with everyday life and their health issues that might restrict them from living their best life" (V5, 34 years, female)
Feelings of contribution, a rewarding experience	"I felt like I was doing something worthwhile, so it was a real positive experience for me" (V7, 70 years, female)
Building or maintaining career skills	"I'm doing my master's in [field], so this has been really a great resource for me, and you know, definitely has given me a lot to think about and areas to look at, certainly with seniors and mental health" (V20, 49 years, female)
Direct impacts on health and wellness: No impacts on volunteers	"For me, it doesn't really impact my health and wellness, to be honest" (V9, 20 years, male)
Direct impacts on own health and wellness: There were impacts on volunteers	"Being part of these projects are keeping my mind functioning and doing researching, reading a lot, following and reflecting" (V12, 56 years, female)

Volunteering outcomes by category.

Outcome category	Mean Level of Agreement (Standard Deviation) *n respondents = 38*
Understanding	11.42 (2.01)
Enhancement	11.34 (2.44)
Values	11.29 (2.08)
Social	11.08 (2.88)
Protective	6.92 (3.69)
Career	6.68 (4.05)

Outcome category scores range from 2 to 14, with higher scores representing amount of agreement with items in each category.

Comparison between baseline and 12-month outcome means for physical activity.

Variable	Baseline Mean (SD)	12-Month Mean (SD)	Mean Difference (12-Month – Baseline), (95 % CI)	Effect Size (Cohen's d)
Vigorous MET Minutes (n = 23)	671.3 (907.2)	1172.2 (1763.1)	500.9 (− 1331.5, 329.8)	0.36
Moderate MET Minutes (n = 22)	932.7 (1505.1)	948.2 (1024.0)	15.5 (− 814.9, 784.0)	0.01
Walking MET Minutes (n = 22)	1788.0 (2960.3)	1322.3 (1486.1)	− 465.7 (− 954.0, 1885.5)	0.20
Vital Signs MET Minutes (n = 20)	1654.0 (2129.3)	2001.0 (2374.9)	347.9 (− 1793.0, 1099.0)	0.15

SD = standard deviation, MET = metabolic equivalent minutes; Vital Signs is moderate plus vigorous activity combined.

Summary

- Mixed methods research naturally lends itself to the clinical problems and research questions encountered in primary care
- Integration is fundamental
  - Integration generates something new = new insights & knowledge
  - Strength & value, “e.g., 1 + 1 = 3”
  - Hallmark of integration = *merging*
    - Converging (*agree*), Connecting (*explain*), Building (*generalize*)
    - Merging can happen from the start…(team, methods, results, theory etc.)
- Require substantial effort and expertise

McMaster University

Family Medicine

David Braley Primary Care Research Collaborative

Thank you!

Department of Family Medicine
Michael G. DeGroote School of Medicine
Faculty of Health Sciences

fammedmcmaster.ca
@McMasterFamMed