

MIXED METHODS RESEARCH (MMR):

- Frequently referred to as the 'third methodological orientation'

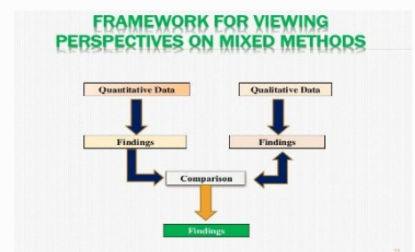
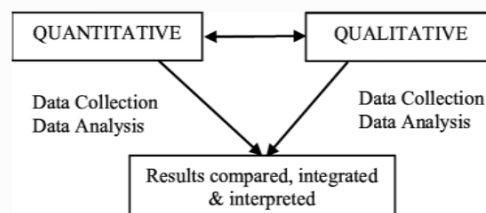
What is Mixed Methods Research (MMR)?

A Mixed methods research design is a research approach whereby researchers collect & analyse both quantitative & qualitative data within the same study to understand a research problem.

- "It is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration."

The key word is 'mixed', as an essential step in the mixed methods approach is data linkage or integration.

- ❑ The researcher Mixes qualitative and quantitative data at the same time (concurrently) or one after the other (sequentially).
- ❑ The concept of mixing methods was first introduced by Jick (1979), for seeking convergence across qualitative & quantitative methods within social science research.
- ❑ This is beyond simply the inclusion of open-ended questions in a survey tool or the collection of demographic data from interview participants, but rather involves the explicit integration of qualitative and quantitative elements in a single study.



Multi versus Mixed Methods

Multi Methods:

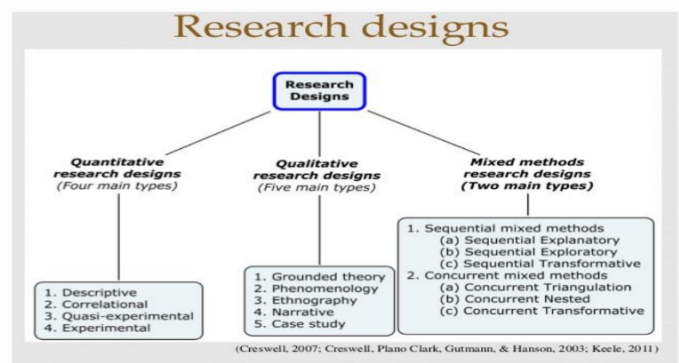
- Uses more than one method.
- Can be two qualitative or two quantitative.

Mixed Methods:

- Uses both qualitative and quantitative.
- Involves mixing & integration of the data so that one type of data informs another.

The Rise of Mixed Method Research (MMR):

- It has a short history as an identifiable methodological movement which can be traced to the early 1980s & has been described as a 'quiet' revolution due to its focus of resolving tensions between the qualitative & quantitative methodological movements.



Philosophy in mixed methods research:

• MMR represents an opportunity to transform these tensions into new knowledge through a dialectical discovery.

□ Dialectical pluralism is: a process theory for dialoging across differences and producing dynamic integration of divergent perspectives and methods to produce a more complex & meaningful whole.

• A pragmatic perspective draws on employing “what works” using diverse approaches, giving primacy to the importance of the research problem and question, and valuing both objective & subjective knowledge.



MMR involves collecting both quantitative and qualitative data:

- Quantitative data
 - Instruments
 - Checklists
 - Records

- Qualitative data
 - Interviews
 - Observations
 - Documents
 - Audio-visual materials

Why Mixed Methods?

- Quantitative data can reveal generalizable information for a large group of people.
- These data often fail to provide specific answers, reasons, explanations or examples.
- Qualitative research provides data about meaning and context regarding the people and environments of study.
- Findings are often not generalizable because of the small numbers & narrow range of participants.
- Both methods have strengths and weaknesses.
- When used together, these methods can be complimentary.
- It Provides a more complete picture of the research problem “Reaching the parts other methods cannot reach”.

Qualitative versus quantitative research

Criteria	Qualitative research	Quantitative research
Purpose	To <u>understand</u> and interpret social interactions	To <u>test hypotheses</u> , look at cause and effect and make predictions.
Group studied	Smaller	Larger
Variables	Study of the whole (not variables).	Specific variables studied.
Form of data collected	Qualitative data, such as open ended responses, interviews, participant observation, and field notes.	Quantitative data based on precise measurement using structured and validated data collection instruments.

Qualitative versus quantitative research (Continued)

Criteria	Qualitative research	Quantitative research
Type of data analysis	Identify patterns, features and themes	Identify <u>statistical</u> relationships
Results	Particular or specialised findings that are <u>less generalizable</u> .	<u>Generalised</u> findings that can be applied to other populations.
Scientific method	<u>Bottom- up</u> - the researcher generates a new theory from the collected data.	<u>Top- down</u> - the researcher tests the theory with the data.

When do you use mixed methods research?

- You have a sense that scores are not telling you the entire story. If you just asked a few people about the concept you might obtain a better understanding.
- Mixed methods research provides a more complete understanding of the research problem than either quantitative or qualitative alone.
- Interpretation of data from one design only might be misleading, for example, a structured questionnaire about teachers’ emotions regarding teaching practices may only show negative or positive emotion without adequately explain the event that triggered the emotions.

Rationales for mixed methods research adopted from (Doyle, Brady, & Byrne, 2016)

Rationale	Explanation
Triangulation (convergence)	Using quantitative and qualitative methods so that findings may be mutually corroborated (Quantitative analyses employ descriptive and inferential statistics, whereas qualitative analyses produce expressive data that provide descriptive details (often in narrative form) to examine the study's research objectives)
Explanation	<ul style="list-style-type: none"> The first phase has findings that require explanation qualitatively (to explain results or how mechanisms work) in causation models. Unexpected findings that need to be explained
Exploration	An initial phase is required to develop an instrument, identify variables to study or develop a hypothesis that requires testing (Explore qualitatively then develop an instrument)
Complementarity	Using different methods to address different parts of the phenomenon, to integrate two different but connected answers to a research question: one reached via a quantitative approach and the other by means of a qualitative one.
Offset weaknesses (compensation)	Ensures that weaknesses of each method are minimised.

May 2022

Planning of MMR:

• 4 questions must be addressed by the researcher during the planning stage of MMR:

1. In what **sequence** will the qualitative and quantitative data collection be implemented?
2. What relative **priority** will be given to qualitative & quantitative data collection & analysis?
3. At what **stage** of the project will the qualitative and quantitative data be integrated?
4. Will an overall **theoretical** perspective be used to guide the study?

• **Priority** in mixed methods design is the **relative weight** assigned to the qualitative and quantitative research components.

• Sometimes priority is referred to as **dominance**.

Notations of MMR:

• The use of **upper case** refers to **emphasis** (i.e. the primary or dominant method), whereas the use of **lower case** refers to **lower emphasis**, priority or dominance.

- QUAN or quan refers to quantitative data.
- QUAL or qual refers to qualitative data.
- MM refers to mixed-methods.
- → data collected sequentially.
- + data collected simultaneously.
- = converged data collection.
- () one method embedded in the other.

Mixed methods designs (According to the order or timing of implementation of the data collection):

- Sequential Explanatory Design
- Sequential Exploratory Design
- Sequential Transformative Design
- Concurrent Triangulation Design
- Concurrent Embedded/Nested Design
- Concurrent Transformative Design

Criteria						
Timing	Designs	Weighting	Mixing/ stage of integration	Notation	Theoretical perspective	Description
Sequential	Explanatory	Usually quantitative	Interpretation phase	QUAN→qual	May be present	The researcher seeks to elaborate on or expand the findings of one method with another method
	Exploratory	Usually qualitative	Interpretation phase	QUAL→quan		
	Transformative	Qualitative, quantitative or equal	Interpretation phase	qual→quan or quan→qual	Use of theoretical perspective (e.g. advocacy)	
Concurrent	Triangulation	Preferably equal; can be quant or qual	Interpretation or analysis phase	QUAN + QUAL	May be present	The researcher converges two types of data at same time to provide an inclusive analysis of the research
	Embedded	Qualitative or quantitative	Analysis phase	QUAN(qual) or QUAL(quant)		
	Transformative	Qualitative, quantitative or equal	Usually analysis phase, can be interpretation phase too	qual + quan or quan + qual	Use of theoretical perspective (e.g. advocacy)	

SEQUENTIAL EXPLANATORY DESIGN:

('QUAN → qual')

- Alternatively, we can refer to it as explanatory design.
- **The most frequently applied** mixed methods design in both health and social sciences literature.
- The reason for favouring sequential explanatory design is that quantitative design in the first stage will portray تمثل the objective **statistical findings** from the group in general.



Afterwards, a qualitative approach can be used to discover **subjective nuances** الفروق الدقيقة from participants as individuals and explain the phenomenon behind the numbers that cannot be described merely by the quantitative data.

- Viewing the study as a **two-phase project**.
- It is denoted by 'QUAN → qual' which represents the **quantitative study occurs first** and has greater weight in addressing the study's aims, **and the qualitative study follows to explain quantitative results**.

- Used to explain the initial quantitative results in more **depth** with qualitative data (e.g. statistical differences among groups).

- The rationale for this approach is that the quantitative data & their subsequent analysis provide a general understanding of the research problem. The qualitative data & their analysis refine & explain those statistical results by exploring participants' views in more depth.

- **This design can be especially useful when** **unexpected results** arise from a quantitative study.

- **Data analysis is usually connected**, and integration usually occurs at the **data interpretation stage**.

- To reiterate, key characteristics:

- Data collection priority (**Quantitative** data).
- Sequence (**First quantitative** data then qual).
- Use of data (**to refine**, elaborate).

- Questions to consider when collecting the qualitative data:

- What results need further explanation?
- What qualitative questions arose from the quantitative results?

- **Interview schedule questions** depend on and are developed based on the quantitative findings.

- In explanatory research where qualitative research is mostly used to substantiate findings generated in a population-level survey, **priority is mostly assigned to the quantitative component**.

Examples on Sequential Explanatory Study:

1• Researchers may ask persons with hearing loss to rate their conversational abilities before and after an aural rehabilitation program (QUAN) & then have the same participants take part in one-on-one clinician-led follow-up interviews to discuss reasons for specific ratings (qual).

2• A study aimed to : 1) to identify the proportion of individuals with cerebral palsy, spinal cord injury, multiple sclerosis, or arthritis who report difficulties with accessing and/or utilising needed health care services; 2) to identify reasons for access or utilisation difficulties and the consequences that these may produce.

- The quantitative component involved a survey that identified a group of ‘accessstressed’ individuals who reported substantial problems in accessing and/or using health care services.
- The qualitative study component focused on this group to examine what specific barriers made access problematic and what consequences resulted from not receiving care when needed.

3• Collaboration amongst clinical nursing leadership teams: a mixed-methods sequential explanatory study

Design

An explanatory sequential mixed-methods design was used (Creswell & Plano Clark 2011), in two phases. Phase One entailed collection of quantitative data, with Phase Two collecting qualitative data for the purpose of explaining initial findings in greater depth (Creswell & Plano Clark 2011).

Data collection

Collaborative behaviours were measured in Phase One using questionnaires mailed to all eligible participants between May and June 2012 via the hospital internal mail system; participants were asked to return them anonymously. To further explore and explain the collaborative behaviour findings, Phase Two employed focus group meetings conducted in April and May 2013, to follow up on initial findings.

Questionnaires

The extent of collaboration between these NLTs was measured using the Collaborative Behaviour Scale (CBS) (Stichler 1990). The CBS was developed to measure respondents' perceptions of collaborative behaviours in relationships between health care professionals. Collaborative behaviours were sought between: NUM-NE, NUM-CNC and NE-CNC, all vice versa. Demographic information identified age, gender, length of experience, specialty work area, highest educational attainment and any postgraduate leadership courses/workshops/learning activities completed.

Focus groups

Following Phase One quantitative data collection, all NUMs, NEs and CNCs were invited by e-mail to participate in focus groups relating to the Phase One findings. Two focus groups were conducted post-analysis to further explore and explain the quantitative survey findings. Both focus groups involved participants from each of the NLT professional groups and allocation was agreed in relation to availability on specific dates.

Data analysis

Descriptive analyses of the quantitative data were performed using the Statistical Package for the Social Sciences (SPSS version 19.0; Chicago, IL, USA). Means, minimum and maximums, and frequency scores were used to describe demographic characteristics, with Fisher's exact tests being used to seek differences between groups. Total scores were calculated by adding the scores for the 20 individual items on the CBS (Stichler 1990). The CBS score median and interquartile ranges were calculated for each group. Non-parametric tests were used to compare the total CBS scores of participants.

Thematic analysis of focus group transcripts used the approach of Braun and Clarke (2008). This process involved: (1) familiarisation with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report.

Example of Sequential Explanatory mixed methods design protocol

UNDERSTANDING THE FACTORS THAT INFLUENCE CLINICAL DECISION-MAKING - A SEQUENTIAL EXPLANATORY MIXED METHODS STUDY PROTOCOL

Priya Manjia, Sandra Monteiro, Gordon Guyatt, John You, Satyan Lakshminrusimha, Susan Jack

ABSTRACT

Background: Despite soaring healthcare costs, patient outcomes are suboptimal in the USA. Efforts to limit healthcare costs and improve quality of care have had limited success. An improved understanding of factors that influence clinical decision-making may provide insight into optimizing the quality and costs of care. The process of healthcare decision-making is contextual, complex and poorly understood. This study aims to explore the factors that influence clinical decision-making in the setting of limited evidence of effectiveness, limited or conflicting guidance, significant resource burden and variation in values and preferences.

Rationale for study design: This sequential explanatory mixed methods study includes a case-based survey (quantitative phase). The results of the survey will guide the sampling and questions for the semi-structured interviews (qualitative phase). The interviews will provide an in-depth explanation of the survey results. Combining the two methods provides complementary information and deeper understanding of the phenomenon of clinical decision-making.

Methods: The quantitative strand will consist of case-based surveys in the fields of neonatology and cardiology. Participants are asked to pick the best management choice for each question followed by a rating of the influence of different factors on a 7-point Likert scale. Follow-up questions explore knowledge and influence of evidence, guideline recommendations and costs on decision-making. Analysis of the survey results will inform sampling and the focus of qualitative interviews. The interviews will be analyzed using qualitative description.

Discussion: To our knowledge, this is the first study using a mixed methods approach including a case-based survey of physicians practicing in diverse settings to explore the factors that influence clinical decision-making. The results of this study may assist with strategies to implement high value care resulting in improved patient outcomes and limiting costs.

Drawbacks of Sequential Explanatory Design:

- It is more time-consuming when compared to concurrent design.
- Potential for loss of participants.
- Can be difficult to fully plan the qualitative arm since it will be dependent on the results of the quantitative results.