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SHORTEN, Allison and SMITH, Joanna

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Mixed methods research: expanding the evidence base

Authors

Allison Shorten¹, Joanna Smith²

¹Professor Allison Shorten, Director, Office of Interprofessional Curriculum, Center for Interprofessional Education and Simulation, University of Alabama at Birmingham, USA.

²Dr Joanna Smith, Lecturer Children's Nursing, School of Healthcare, University of Leeds, Leeds, UK.

Correspondence

¹Professor Allison Shorten, Director, Office of Interprofessional Curriculum, Center for Interprofessional Education and Simulation, University of Alabama at Birmingham, USA

e-mail ashorten@uab.edu

Introduction

'Mixed methods' is a research approach whereby researchers collect and analyse both quantitative and qualitative data within the same study.^{1,2} Growth of mixed methods research in nursing and healthcare has occurred at a time of internationally increasing complexity in healthcare delivery. Mixed methods research draws on potential strengths of both qualitative and quantitative methods³, allowing researchers to explore diverse perspectives and uncover relationships that exist between the intricate layers of our multi-faceted research questions. As providers and policy makers strive to ensure quality and safety for patients and families, researchers can utilize mixed methods to explore contemporary health care trends and practices across increasingly diverse practice settings.

This article will outline common types of mixed methods designs and provide examples of how nursing researchers can apply different mixed methods designs in order to answer important nursing practice questions.

What is mixed methods research?

Mixed methods research requires a purposeful mixing of methods in data collection, data analysis, and interpretation of the evidence. The key word is 'mixed', as an essential step in the mixed methods approach is data linkage, or integration at an appropriate stage in the research process.⁴ Purposeful data integration enables researchers to seek a more panoramic view of their research landscape, viewing phenomena from different viewpoints and through diverse research lenses. For example, in a randomized controlled trial evaluating a decision aid for women making choices about birth after caesarean, quantitative data was collected to assess knowledge change, levels of decisional conflict, birth choices and outcomes.⁵ Qualitative narrative data was collected to gain insight into women's decision making experiences and factors that influenced their choices for mode of birth.

In contrast, multi-method research utilizes a single research paradigm, either quantitative or qualitative. Data is collected and analysed using different methods within the same paradigm.^{6,7} For example, in a multi-methods qualitative study investigating parent-professional shared decision-making regarding diagnosis of suspected shunt malfunction in children, data collection included audio recordings of admission consultations and interviews one-week post consultation, with interactions analysed using conversational analysis and the framework approach for the interview data.⁸

What are the strengths and challenges in using mixed methods?

Selecting the right research method starts with identifying the research question and study aims. A mixed methods design is appropriate for answering research questions that neither quantitative nor qualitative methods could answer alone.^{4,9-11} Mixed methods can be used to gain a better

understanding of connections or contradictions between qualitative and quantitative data; they can provide opportunities for participants to have a strong voice and share their experiences across the research process; and they can facilitate different avenues of exploration that enrich the evidence and enable questions to be answered more deeply.¹¹ Mixed methods can facilitate greater scholarly interaction and enrich the experiences of researchers as different perspectives illuminate the issues being studied.¹¹

The process of mixing methods within one study, however, can add to the complexity of conducting research. It often requires more resources (time and personnel) and additional research training, as multi-disciplinary research teams need to become conversant with alternative research paradigms and different approaches to sample selection, data collection, data analysis and data synthesis or integration.¹¹

What are the different types of mixed methods designs?

Mixed methods research comprises different types of design categories including explanatory, exploratory, parallel, and nested (embedded) designs.² Table 1 summarizes the characteristics of each design, the process used, and models of connecting or integrating data. For each type of research, an example was created to illustrate how each study design might be applied to address similar but different nursing research aims within the same general nursing research area.

Table 1: Types of Mixed Methods Designs*

Mixed method type	Research processes	Examples
Explanatory Sequential	Quantitative data is collected and analysed first, then qualitative data is collected and analysed to help explain quantitative data QUAN → QUAL	AIM: Identify levels of stress among new graduate registered nurses (RNs) working in emergency room (ER) settings QUAN: National survey of new RNs working in ER settings measuring levels of workplace stress QUAL: Personal interviews with 15-20 new RNs working in ER settings to discuss their experiences with stressful workplace situations. SYNTHESIS: Sequential QUAL data helps explain QUAN data
Exploratory Sequential	Qualitative data is collected and analysed first, then quantitative data is collected and used to test findings empirically QUAL → QUAN	AIM: Identify highest sources of workplace stress for new RNs working in hospital ERs. QUAL: Focus group data collected from newly registered RNs working in hospital ERs within a local area health service to discuss workplace stress. QUAN: QUAL data used to create a national survey administered to all RNs working in ERs about sources of workplace stress experienced within their first year of practice. SYNTHESIS: Sequential QUAL data informs collection of QUAN data which verifies QUAL data
Parallel	Qualitative and quantitative data collected and analysed concurrently. QUAL + QUAN	AIM: Identify sources of stress for RNs working in ER settings, personal coping strategies used, and types of programs or support systems provided by hospitals. QUAN: National survey of all RNs working in ER departments, based on the literature, to identify common sources of stress and methods of support used by employers to reduce RN stress. QUAL: Focus groups and interviews with a random selection of RNs working in ERs to broaden understanding of different sources of stress and personal coping strategies used. SYNTHESIS: Data integration during interpretation phase after QUAN and QUAL data analysis.
Nested	Can be either QUAL or QUAN main design with the alternative paradigm embedded within the study to answer a complementary question. QUAL + quant or QUAN + qual	AIM: Test an on-line peer support program designed to reduce workplace stress for new RNs working in ERs. QUAN: Randomized controlled trial to test on-line program effect on stress levels and intention to remain working in the ER. qual: Interview nested in the RCT, focused on user-experiences of the on-line program. SYNTHESIS: qual analysis embedded within the main QUAN study.

*Table adapted from Halcomb and Hickman⁷

What should be considered when evaluating mixed methods research?

When reading mixed methods research or writing a proposal using mixed methods to answer a research question, the six questions below are a useful guide:¹²

1. Does the research question justify the use of mixed methods?
2. Is the method sequence clearly described, logical in flow, and well aligned with study aims?
3. Is data collection and analysis clearly described and well aligned with study aims?
4. Does one method dominate the other or are they equally important?
5. Did the use of one method limit or confound the other method?
6. When, how, and by whom is data integration (mixing) achieved?

For more detail of the evaluation guide, refer to the McMaster University Mixed Methods Appraisal tool (MMAT).¹² The quality checklist for appraising published mixed methods research could also be used as a design checklist when planning mixed methods studies.

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