



Mixed methods research: expanding the evidence base

Allison Shorten,¹ Joanna Smith²

10.1136/eb-2017-102699

¹School of Nursing, University of Alabama at Birmingham, USA

²Children's Nursing, School of Healthcare, University of Leeds, UK

Correspondence to:

Dr Allison Shorten,
School of Nursing, University of Alabama at Birmingham, 1720 2nd Ave South, Birmingham, AL, 35294, USA; ashorten@uab.edu; 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 methods,³ allowing researchers to explore diverse perspectives and uncover relationships that exist between the intricate layers of our multifaceted research questions. As providers and policy makers strive to ensure quality and safety for patients and families, researchers can use mixed methods to explore contemporary healthcare 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 randomised controlled trial (RCT) evaluating a decision aid for women making choices about birth after caesarean, quantitative data were collected to assess knowledge change, levels of decisional conflict,

Table 1 Types of mixed methods designs*

Mixed method type	Research processes	Examples
Explanatory sequential	Quantitative data are collected and analysed first, then qualitative data are 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 help explain QUAN data
Exploratory sequential	Qualitative data are collected and analysed first, then quantitative data are 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 inform collection of QUAN data, which verify 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 programmes 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 analyses
Nested	Can be either QUAL or QUAN main design with the alternative paradigm embedded within the study to answer a complementary question QUAL + quan or QUAN + qual	AIM: Test an online peer support programme designed to reduce workplace stress for new RNs working in ERs QUAN: RCT to test online programme effect on stress levels and intention to remain working in the ER qual: Interview nested in the RCT, focused on user experiences of the online programme SYNTHESIS: qual analysis embedded within the main QUAN study

*Table adapted from Halcomb and Hickman.⁷

QUAN, quantitative; QUAL, qualitative.

birth choices and outcomes.⁵ Qualitative narrative data were collected to gain insight into women's decision-making experiences and factors that influenced their choices for mode of birth.⁵

In contrast, multimethod research uses a single research paradigm, either quantitative or qualitative. Data are collected and analysed using different methods within the same paradigm.^{6,7} For example, in a multimethods 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 1 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 multidisciplinary 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 summarises 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.

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 guide¹²:

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.¹² The quality checklist for appraising published mixed methods research could also be used as a design checklist when planning mixed methods studies.

Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.

© Article author(s) (or their employer(s) unless otherwise stated in the text of the article) 2017. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

References

1. Bowers B, Cohen LW, Elliot AE, et al. Creating and supporting a mixed methods health services research team. *Health Serv Res* 2013;48:2157-80.
2. Creswell JW, Plano Clark VL. *Designing and conducting mixed methods research*. Thousand Oaks, California: Sage Publications, 2011.
3. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual framework for mixed-method evaluation designs. *Educ Eval Policy Anal* 1989;11:255-74.
4. Ivankova NV. Using mixed methods sequential explanatory design: from theory to practice. *Field methods* 2006;18:3-20.
5. Shorten A, Shorten B, Kennedy HP. Complexities of choice after prior cesarean: a narrative analysis. *Birth* 2014;41:178-84.
6. Andrew S, Halcomb EJ. *Mixed Method Research*. In: Borbasi S, Jackson D, eds. *Navigating the maze of research: enhancing nursing & midwifery practice*. 3rd ed. Marrickville, New South Wales: Elsevier, 2012.
7. Halcomb E, Hickman L. Mixed methods research. *Nurs Stand* 2015;29:41-7.
8. Smith J, Cheater F, Bekker H, et al. Are parents and professionals making shared decisions about a child's care on presentation of a suspected shunt malfunction: a mixed method study? *Health Expect* 2015;18:1299-315.
9. Tashakkori A, Creswell JW. Editorial: exploring the nature of research questions in mixed methods research. *J Mix Methods Res* 2007;1:207-11.
10. Tashakkori A, Teddlie C, eds. *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage, 2003.
11. Wisdom J, Creswell JW. *Mixed methods: integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models*. Rockville, MD: Agency for Healthcare Research and Quality, 2013.
12. National Collaborating Centre for Methods and Tools. *Appraising qualitative, quantitative, and mixed methods studies included in mixed studies reviews: the MMAT*. Hamilton, ON: McMaster University, 2015. <http://www.nccmt.ca/resources/search/232> (accessed May 2017).