

# A nurses' guide to mixed methods research

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## KEY WORDS

research methodology, qualitative research, quantitative research, mixed methods, triangulation, evidence based practice (EBP).

## ABSTRACT

### **Objective**

This article provides a breakdown of the components of mixed methods research methodology. The intention of the article is to simplify the terminology and process of mixed methods research to enable novice readers of research to have a better understanding of the language and concepts involved. The Survey method, using both qualitative and quantitative research methods, will be used to explain the principles of mixing methods.

### **Primary Argument**

Australian nurses work in an environment where evidence-based practice is mandatory. Understanding the research process and terminology used may benefit nurses to implement research in their day-to-day practice. Gaining knowledge of the different approaches used in mixed methods research is paramount if nurses are to base their care on research which has utilised this style.

### **Conclusion**

As mixed methods are used in nursing, social and behavioural research it is essential that nurses understand the methodology. The main components of mixed methodology will, therefore, be discussed in a systematic, logical order.

## INTRODUCTION

Currently the Nursing and Midwifery Board of Australia include a requirement for nurses to evaluate and implement research in their care (Borbasi and Jackson 2012, p.22; Nursing and Midwifery Board of Australia 2013a). All nurses are expected to be actively involved in implementing or undertaking research (Borbasi and Jackson 2012, p.22) as a major goal of nursing research is to improve health care and outcomes (Moxham 2015; Benner 1984). Evidence based or 'best practice' nursing in Australia is supported by the Joanna Briggs Institute (Chang and Daly 2012). As evidence based practice and research are threaded through professional work and study in the health sciences (Wright-St Clair et al 2014, p.5) nurses, particularly novice nurses, may benefit from a discussion that helps them understand the sequence of a research paper (Moxham 2015) using mixed methods.

The emergence of mixed methods, which was considered a third methodological movement, began during the 1980's (Tashakorri and Teddie 2003). The first and second movements were quantitative methodology and qualitative methodology. Mixed methods are also known as 'multi-methodology' or 'triangulation' and are considered to have high validity due to the variation in data collection (Bulsara 2015; Taket 2013). Mixed methods research is further defined by Jirowong et al (2014, p.360) as research that 'systematically combines the collection and analysis of both qualitative and quantitative data in the same study'. This style of research allows investigators to combine both numeric and narrative data in their analysis (Lewis, 2013 p.166). Mixing methods offers a richer explanation than single use of either qualitative or quantitative methods as it can draw on the strength of each approach and overcome their weaknesses (Lewis 2013, p.167; National Institutes of Health 2011). The range and description of how methods can be mixed is extremely wide (Wurtz 2015; Taket 2013) therefore this paper will address mixed methods very broadly.

## THE MIXED METHODS RESEARCH PAPER

### The rationale behind using a mixed methods approach

Many authors and investigators have discussed the rationale behind combining qualitative and quantitative research methodology. The following discussion provides a breakdown of the main reasons for using mixed methods.

Mixed methodology can answer a research question from a number of perspectives and ensures there are no, or fewer, 'gaps' to the information collected (Bulsara 2015; Jirowong et al 2014). Pre-existing assumptions from the researcher are less likely to occur, and inferences made stronger, as different approaches can yield broader information given that one method may not be able to provide all the information required (Bulsara 2015; Jirowong et al 2014). As Wurtz (2015) explains, using mixed methods can provide a deeper understanding of behaviour, or a better idea of the meaning behind what is occurring. Most significantly mixed method research can include culture in the design by giving a voice to everyone involved in the behaviour being examined (Wurtz 2015). As Taket (2013) further explains, mixed methods can empower research participants by providing appropriate means for them to choose how and whether to participate. For example, a self-completion questionnaire excludes those who do not have the ability to read or write (Taket 2013), however, if an interview is also included in the methodology, they may be able to participate with greater autonomy (Liamputtong 2013, p.326).

There are six categories of Mixed Method Designs (Wurtz 2015) described in the grid at the end of this paper. Creswell and Plano Clark (2011, pp.69 - 101) agree there are six major designs but attribute several differing names to those given by Wurtz (2015).

In brief, a mixed methods study is not two separate studies addressing a specific issue but one study that employs different methods to address a specific research question or hypothesis (Jirojwong et al 2014, p.281).

### **Survey Method**

The Survey Method will be used as an example of how qualitative and quantitative frameworks can be used together to research subjects. A survey is defined as a data collection tool to gather information about individuals (Privitera 2014). It may aim to collect factual information (quantitative data) and/or opinions of individuals through interviews (qualitative data). Surveys may be wholly quantitative but using mixed methods allows for greater depth. It is one of the most commonly used methods in social science research (Hamer and Collinson 2014).

### **Abstract/Summary**

An abstract or summary of a mixed methods paper using survey technique will provide a brief objective summary of the research report. The rationale and background of the study should be provided and also include the theoretical and methodological processes for gathering information (Borbasi and Jackson 2012).

### **Identifying the problem**

Survey designs can use a hypothesis (Privitera 2014) or research question (Jirojwong et al 2014, p.273). A hypothesis is defined by Johnson and Hengstberger-Sims (2014, p.35) as a statement about the relationship between two or more variables (also known as factors or characteristics). Whilst a survey can be used as a measurement tool in many research designs, survey research specifically refers to the use of surveys to quantify, describe or characterise an individual or group (Privitera 2014).

### **Literature Search**

The literature review is generally found in the introductory section of a research paper (Polit and Hungler 2013). The function of a literature search in mixed method research varies depending on the classification of the study. As a survey consists of many questions, or statements, to which participants respond, the literature may be used to inform the researcher of questions or approaches previously used.

## **METHODOLOGY**

### **Design**

The survey research design can be administered either in written form and/or through interview. The survey will include a series of questions or statements, called items, used in a questionnaire and /or interview to measure responses (Privitera 2014, p.226).

There are three types of questions or statements used in a survey, namely open-ended items, partially open-ended and restricted items (Privitera, 2014). The open-ended questions can be used in interviews on an individual basis, or within a focus group, to glean qualitative information. A focus group is based on group discussion to elicit the respondent's perceptions, opinions, beliefs and attitudes (Jirojwong et al 2014, p.359). The participants are able to express their views by interacting within a group discussing an issue or number of issues (Liamputtong 2013). Partially open questions have several set answers but allow the researcher to ask extra questions (Jirojwong et al 2014; Liamputtong 2013). An example of a restricted item, also known as a closed-ended item, includes restricted answer options and commonly uses a Likert scale (Privitera 2014). The Likert scale usually has between three and seven columns with options such as strongly agree, agree, not sure, disagree and strongly disagree. Whilst the Likert scale can be used to elicit responses regarding attitudes and beliefs, statistics can be produced from the responses as the responses can be assigned a numerical value (Jirojwong et al 2014, p.360).

Other response formats may include verbal rating scales where a range of verbal responses are provided and the participant circles the one that most closely mirrors their view, or visual analogue scales, which asks the respondent to mark a position on a line between 0 and 10 or 0 and 100 depending on the nature of the question (Liamputtong 2013, p.212)

### **Sample**

The sample population is very variable in mixed methods research. It can vary from small groups to huge populations. Subjects of survey research may be called participants, informants or subjects. Samples may be selected using convenience (purposive) or probability (random) techniques which means the sample was specifically chosen to ensure the data gathered is 'information-rich' (Borbasi and Jackson 2012, p.135). The quantitative element will mean the sample can be larger but sampling decisions need to be based on the research question. As Lewis (2013 p.277) further explains, mixed methods research has at least two components, elements or phases which means drawing a sample is hard to specify but, very generally speaking, a qualitative (purposive) sample would be less than 30 and a quantitative (probability) sample would be greater than 50.

Concurrent designs (merging qualitative and quantitative research) include the need for adequate sample sizes and being consistent in analysis whereas sequential designs (one phase of qualitative research which then builds on quantitative research or vice versa) results in decisions needing to be made on choosing appropriate sampling and sample sizes for both phases (National Institutes of Health 2011). To put it simply, it is very hard to match qualitative data to quantitative data as investigators, who hold different philosophical positions, may find mixed methods research to be challenging because of the tensions created by their differing beliefs (National Institutes of Health 2011).

### **Ethics**

Consent should be obtained after full explanation of the study's intent (Borbasi and Jackson 2012). All nursing research should consider ethics and potential harm (Nursing and Midwifery Board of Australia 2013b). For example, data collection from web surveys should be undertaken so identities cannot be accessed. Participants should be de-identified (Liamputtong 2013, p.30). The investigator is obliged to consider the implications of the proposed research for the participating subjects, their families and society (Burns and Grove, 2009). Permission for nursing research is sought from an ethics committee appropriate to the situation (Jirojwong et al 2014, pp.63-66; Elliott et al 2013, p.93). The ethical principles of autonomy, beneficence, non-maleficence and justice are widely acknowledged in contemporary regulatory research ethics frameworks (Liamputtong 2013, p.27).

### **Pilot Study**

A pilot study as a trial run of the research which is conducted on a small number of participants (Polit and Hungler 2013; Nieswiadomy 2012). The pilot study allows the researcher to assess the adequacy and feasibility of the intended research (Moxham 2015, p.35). With mixed methods research, using a survey technique, is important to identify problems or 'flaws' and strengthen the combination of qualitative and quantitative methodology by identifying practical and methodological issues (Bulsara 2015). Modifications can be made prior to the main study (Kim 2011).

### **Main Study**

Issues of validity are challenging as qualitative and quantitative research have developed through different pathways (Jirojwong et al 2014, p.279). The essential component for the researcher is to ensure the research demonstrates the established research rigour required by each method (Teddie and Tashakkori 2009, cited in Jirojwong et al 2014). It is generally accepted that the qualitative or quantitative elements in a mixed methods study can have equal status or that one approach may be dominant.

In mixed methods research the investigators intentionally integrate and combine both qualitative and quantitative data rather than separate it. The challenge is how to integrate it (National Institutes of Health 2011). As Liamputtong (2013, p.339) states the combination of qualitative and quantitative data can produce a richer understanding of a number of different factors within a piece of research.

### **Analysis and Results**

Investigators may use codes or colour coding to identify common themes. The codes can be counted and totals given for a response frequency (Bulsara 2015). This works well with survey questions and responses which generate figures but the data can also be considered qualitative if the researcher is seeking opinions and attitudes (Bulsara 2015). The main findings will be discussed according to which design was used (refer to GRID below). Issues may arise when analysing the data because of the combination of the qualitative and quantitative designs. This may mean the researcher has to gather more data or revisit databases (National Institutes of Health 2011).

Two articles in this series discuss this section in more depth, namely, A nurses' guide to Quantitative research (Ingham-Broomfield 2014) and A nurses' guide to Qualitative research (Ingham-Broomfield 2015).

### **Discussion/Recommendations**

Whatever method is used in research papers, this section usually tries to clarify what the results mean. There should be an interpretation of the results, the study limitations and possible implications for further research to advance knowledge (Polit and Hungler 2013; Nieswiadomy 2012). The researcher will discuss problems encountered including the methodology chosen.

### **Conclusions of the research paper using mixed methods**

Any research study design and findings need to be critiqued by the author(s) in the research study's discussion section. The investigators may discuss the complexity of the mixed methods approach. Most conclusions summarise the main points, review the research method, repeat the findings, discuss the limitations and offer suggestions for future research related to the subject researched (Nieswiadomy, 2012).

### **Reference list**

The Reference List will contain research papers including books and other journal articles which may contain a selection of qualitative, quantitative and mixed methods sources to support the concepts outlined (Ingham-Broomfield 2014).

### **CONCLUSION**

The methodological approach used in this paper has discussed mixed methods, using the survey method as an example, in a logical and systematic order. This paper has discussed the main components of mixed methods research for nurses who are new to this process and its terminology.

## GRID

Quantitative (QUAN) and Qualitative (QUAL)

Category	Sequential Explanatory Design	Sequential Exploratory Design	Sequential Transformative design	Concurrent Triangulation Design	Concurrent Nested Design	Concurrent Transformative Design
Collection and analysis of data	QUAN stage followed by QUAL stage	2 stages -Priority given to QUAL data followed by QUAN	2 distinct stages –theoretical perspective used to guide the study	QUAL and QUAN data collection is concurrent – only one data collection phase	QUAL and QUAN data collection is concurrent	Guided by a specific theoretical perspective. QUAL and QUAN collected during the same phase
Priority given to which data	QUAN	QUAL	Whichever serves the theoretical perspective best	Ideally equal priority to both QUAL and QUAN	Either QUAL or QUAN dominate the design	Ideally equal priority to both QUAL and QUAN
Integration of data occurs during this research phase	Interpretive phase	Interpretive phase	Interpretive phase	Interpretive phase	Analysis phase mixes both QUAL and QUAN data	Analysis phase but can also occur in the interpretive stage
Purpose	QUAL results used to help explain QUAN results	QUAN data used to help interpret QUAL phase	Whichever serves the theoretical perspective best	Focuses on similarities and differences, with the primary purpose to support each other	QUAL used to better explain QUAN data	The purpose is to use methods that will best serve the theoretical perspective of the researcher

(Wurtz 2015; Lewis 2013)

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