

Setting a research question, aim and objective

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Abstract

Aim To describe the development of a research question, aim and objective.

Background The first steps of any study are developing the research question, aim and objective. Subsequent steps develop from these and they govern the researchers' choice of population, setting, data to be collected and time period for the study. Clear, succinctly posed research questions, aims and objectives are essential if studies are to be successful.

Discussion Researchers developing their research questions, aims and objectives generally experience difficulties. They are often overwhelmed trying to convert what they see as a relevant issue from practice

into research. This necessitates engaging with the relevant published literature and knowledgeable people.

Conclusion This paper identifies the issues to be considered when developing a research question, aim and objective. Understanding these considerations will enable researchers to effectively present their research question, aim and objective.

Implications for practice To conduct successful studies, researchers should develop clear research questions, aims and objectives.

Keywords research question, research aim, research objective, study development, nursing research, novice researchers

Introduction

DEFINING THE research question is a particularly significant step in research as it narrows the research aim and objective down to specific areas the study will address (Creswell 2014, Johnson and Christensen 2014). Research questions are vital as they guide the choice of methodology, methods, sample, sample size, data collection instrument and data analysis techniques (Lipowski 2008).

Selecting and constructing a good research question is one of any study's most difficult aspects (Blaikie 2007, 2009, Aslam and Emmanuel 2010). Despite this, there is little direction on creating good research questions (Lipowski 2008). They do not appear spontaneously and the ability to pose good questions is a skill that can be refined and developed with direction and collaboration from colleagues and supervisors (Thabane *et al* 2009). Importantly, research questions are not static: they change, adapt or are refined when

researchers work through the different steps of the design cycle, reviewing the literature, integrating theory and developing a conceptual framework (Hennink *et al* 2011).

Novice researchers are often overwhelmed and bewildered when trying to convert what they see as relevant issues from practice into a study. This difficulty arises as they progress their work and they feel they know what they need to answer.

Only by consulting a supervisor and/or other knowledgeable people about the research and critical evaluation of the relevant published literature can researchers develop research questions, aims and objectives. Developing a research question is an interactive and inductive endeavour that takes place over time.

A clear research question is vital and sets the scene for development of a clear research aim and objective that are inextricably linked (Martindale and Taylor 2014).

Table 1 Types of quantitative research question

Type	Question
Descriptive	<ul style="list-style-type: none"> ■ Seeks to quantify responses to one or more variables ■ Often begins with 'What is...?' or 'What are...?'
Comparative	<ul style="list-style-type: none"> ■ Seeks to compare two or more groups for some outcome variable ■ Often uses words such as 'compare' ■ When it involves two groups it can be written as: 'What is the difference in (dependent variable) between (group 1) and (group 2)?' ■ Can be extended to three or more groups by replacing the word 'between' with 'among' ■ Can be causal in nature, such as the effect of X on Y ■ Such causal questions are implicitly comparative in nature when a comparison is made between a group where X is involved and a group where X is not involved
Relationship	<ul style="list-style-type: none"> ■ Is concerned with trends between or among two or more variables ■ Often uses words such as 'relate', 'relationship', 'association' and 'trend' ■ Relationship questions involving two variables usually can be written using: 'What is the relationship between (independent variable) and (dependent variable) among (population)?' ■ Can be extended to three or more variables by replacing the word 'between' with 'among'

(Onwuegbuzie and Leech 2006)

Researchers should:

- Develop a research problem that matches your interests, background, training and publications.
- Base research on current evidence.
- The research question should logically present each step in a progression from what is known to important issues that are not.
- Do not try to be 'research trendy'. Do not follow a trend or issue with little evidence from the literature or little idea of how it will add to the knowledge base.
- Avoid topics. Look at clearly defined research problems instead.
- Stay focused. You will find many things of interest along the path, but you should ask yourself: 'Is this related to what I want to uncover or just a point of interest?'

Research questions

Research questions can be developed from theoretical knowledge, previous research or experience, or a practical need at work (Parahoo 2014). They have numerous roles, such as identifying the importance of the research, providing a framework, direction and cohesion,

and setting the limits by revealing the boundaries of the study and highlighting the type of data to be collected (White 2009).

Quantitative research questions These tend to be precise and can be categorised as 'descriptive', 'comparative' or 'relationship' (Table 1). Words such as 'do', 'does', 'is' or 'are' should be avoided as they invite 'yes'/'no' responses.

Appropriate questions should highlight the population, dependent variables and design (historical, descriptive, correlational, experimental, causal-comparative, quasi-experimental), and the link between the research question and the design (Onwuegbuzie and Leech 2006, Kloda and Bartlett 2013). In comparative/relationship research questions, independent variables should also be highlighted.

Qualitative research questions are flexible, adaptable and non-directional (Creswell 2013). They seek to determine or discover a process, or define experiences. They are normally used to try to understand particular educational, familial or social processes or experiences that happen in a specific location and/or context (Marshall and Rossman 2011). They usually describe and address 'what' and 'how' questions, avoiding words such as 'affect', 'influence', 'compare' and 'relate'.

Qualitative research questions These can represent broad or central areas of research or specific areas or sub-categories (Creswell 2013). Sub-questions can address important concerns and difficulties to be resolved or describe the context. Like quantitative questions, qualitative questions link to research design, including historical/narrative, case study, ethnography, phenomenology, grounded theory and autoethnography.

Generally, these questions are non-directional and use words that state that the study will: 'discover' (grounded theory), 'explain' or 'seek to understand' (ethnography), 'explore a process' (case study) or 'describe the experiences' (phenomenology).

Researchers can often find developing qualitative questions difficult (Agee 2009). To help researchers think about the different types and purposes of their studies, constructs for question types are presented in Table 2. Comparative questions are often overlooked in qualitative research. Onwuegbuzie and Leech (2007) described four measures that compare:

1. Participants pairwise (pairwise sampling designs).
2. Two or more subgroups (subgroup sampling designs).

3. Two or more members of the same subgroup, wherein one or more members represents a sub-sample of the full sample (nested sampling designs).
4. Two or more subgroups that are extracted from different levels of a study (multilevel sampling designs).

Mixed-methods studies Researchers conducting these studies can choose to develop separate quantitative questions and qualitative questions or develop a mixed methods question depending on the study (Creswell 2009). Separate quantitative and qualitative questions are appropriate when the approaches, not the mixed methods or integrative component of the study, are the focus (Tashakkori and Teddlie 2010). This identifies the significance of the qualitative and quantitative phases of the study and their collective power (Creswell and Plano Clarke 2011).

The development of a mixed methods question should reflect the procedures or the content and not include separate quantitative and qualitative questions (Creswell 2009, Tashakkori and Teddlie 2010). This suggests that there is some integration or linking between the study’s quantitative and qualitative phases (Tashakkoria and Teddlie 2010, Creswell and Plano Clark 2011).

Overall, good research questions are the basis of good research as they enable researchers to identify what they want to know and to work from knowing less towards knowing more (Payne and Payne 2004). Identifying what you want to know more about is essential. Researchers can be vague at the beginning of a study about what they want to know and unclear questions can lead to an unfocused project (White 2009). Researchers should aim to write clear, articulated questions that enable them to find the answers in a focused, clear way.

Criteria One difficulty in writing good research questions is that there are potentially an unlimited number of them. Without a clear, focused research question, it is difficult to know how or what to research (Grove *et al* 2013). While researchers may appreciate that if they do not know what questions they are asking, there is little hope of finding any answers, this may only add stress to an already tense situation.

Common problems encountered when developing a research question include: deciding which area to research from a range of issues that are of interest; knowing which area to focus on with no precise topic; and knowing the area and topic but finding it problematic to clearly communicate the question.

The authors suggest that once the research topic has been identified, the researcher should begin framing the research question by listing all the questions that could be researched. This may be a large or small list with questions interconnected or very different. Forming the right questions should be seen as an iterative process that occurs through continually engaging in reading and refining ones ideas at all stages (Maxwell 2013).

Hulley *et al*'s (2007) criteria for quantitative research are:

- Feasible.
- Interesting.
- Novel .
- Ethical.
- Relevant.

These criteria are collectively known as FINER.

Cooke *et al*'s (2012) characteristics of qualitative research are:

- Sample
- Phenomena of interest
- Design
- Evaluation
- Research type

These characteristics are collectively known as SPIDER. Researchers informed by these criteria and characteristics are likely to identify important aspects of research questions and develop successful research projects (Farrugia *et al* 2010). However, while researchers can refer to these criteria in

Type	What it does
Contextual	Describes the form or nature of what exists
Explanatory	Examines the reasons for or associations between what exists
Evaluative	Appraises the effectiveness of what exists
Generative	Provides new ideas, aiding the development of theories, strategies or actions
Ideological	Advances the ideology of a position
Exploratory	Investigates a phenomenon where little is understood
Explanatory	Explains a phenomenon
Descriptive	Tries to describe a phenomenon
Emancipatory	Engages in social action related to a phenomenon

(Ritchie *et al* 2014, Marshall and Rossman 2011)

identifying important general aspects of a research question, a more specific format should be considered when developing specific research questions (Farrugia *et al* 2010).

Richardson *et al*'s (1995) format for quantitative research is:

- Population, patient, problem.
- Intervention.
- Comparison.
- Outcome.

This format is known as PICO.

Kahn *et al*'s (2003) format for qualitative research is:

- Population, problem.
- Exposure.
- Outcome or theme.

This format is known as PEO.

These methods have been used in evidence-based practice to frame and answer clinical questions (Huang *et al* 2006), develop strategies for searching literature (Schardt *et al* 2007), and frame research questions (Aslam and Emmanuel 2010). Once a research question has been identified, the research aim and objectives are developed. Developing a research question can be difficult, as can stating the research aim and objectives (Blaikie 2009).

Aims The researcher must be cognisant that the research's question, aim and objectives are inextricably linked. To determine the study's aim, the researcher must decide what its overall,

long-term aim is and describe the overall purpose (what should be accomplished) in general terms. This ultimately enables the reader to judge whether the researcher has achieved that purpose (Tully 2014). In this context, the Newman *et al* (2003) framework can be used to identify nine types of aim. These are to:

- Predict.
- Add to the knowledge base.
- Have a personal, social, institutional, and/or organisational impact.
- Measure change.
- Understand complex phenomena.
- Test new ideas.
- Generate new ideas.
- Inform constituencies.
- Examine the past.

Objectives Determining the research's aim leads naturally to determining its objectives. Research objectives are more specific than the aim and relate directly to the research question (Grove *et al* 2014, Parahoo 2014). They may be divided into 'primary' (bound to be achieved) and 'secondary' (incidental) objectives (Newell and Burnard 2011), and should be: closely related to the research question, cover all aspects of the problem, specific, ordered in a logical sequence, achievable, take into consideration the available resources, including time, and mutually exclusive of each other. They should also be stated using action verbs that can be evaluated,

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such as 'to describe', 'to identify', 'to measure' or 'to compare'.

Johnson and Christensen (2014) offer five typical research objectives: 'exploration', 'description', 'explanation', 'prediction' and 'influence'. Qualitative and quantitative research studies can be linked to one or more of these five research objectives (Onwuegbuzie and Leech 2006):

- 'Exploration' involves using mainly inductive methods to discover a concept, construct, phenomenon or situation and advance understanding, hypotheses or generalisations.
- 'Description' involves identifying and describing the antecedents, nature and aetiology of a phenomenon.
- 'Explanation' involves developing theory for the purpose of explaining the relationships among concepts or phenomena and determining reasons for the existence of events.
- 'Prediction' refers to using pre-existing knowledge or theory to predict what will occur at a later point in time.
- 'Influence' relates to manipulation of the setting or variable to produce an anticipated outcome.

Doran's (1981) criteria can be applied when setting research objectives. These are:

- Specific: be exact about what you are going to accomplish.
- Measurable: quantify the objectives.
- Appropriate: align with the needs of the target audience.

- Realistic: do you have the resources to make the objective happen?
- Time specific: state when you will achieve the objective.

These criteria are collectively known as SMART.

It should be acknowledged that there is some debate as to whether research aims and objectives are required for all studies, and whether either or both are necessary. This is evident in published studies where only the research aim or the objectives are identified. This may be because only one was set or only one was identified in the published work.

Conclusion

Developing a good research question, aim and objective is a vital aspect of research. This can be challenging. It is essential that you take the time to do this systematically as the eventual success of the study relies on asking a suitable and clear question. The question must be grounded in research, coherent, clear and ask precisely what you want to find out. Knowing this will help you plan the project and identify the methodology, sample, data collection and data analysis necessary.

Developing the research question, aim and objective is an interactive and inductive process that takes place over time, through consultations with a supervisor, knowledgeable people, published literature, and use of the appropriate criteria (FINER and SPIDER) and format (PICO and PEO).

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Conflict of interest
None declared

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