Asia Pacific Family Medicine 2003; **2**: 42–44

RESEARCH METHODOLGY

Choosing a research question

Roger JONES

Guy's, King's & St Thomas' School of Medicine, London, United Kingdom

Introduction

Deciding on an answerable and relevant research question lies at the heart of all good research projects. In this article, I will attempt to lay out the process of developing, refining and settling on a research question and assessing the quality of the question itself and the research that is likely to result from it. I will try to illustrate some of these points by reference to my own experiences, both as a researcher in primary care for the last 20 years and as editor of Family Practice, an international journal of primary medical care.

The stimulus to ask a question

The wish to choose a research question can arise at almost any stage in a medical career, from an undergraduate medical student embarking on a Bachelor of Science degree (BSc) or other project work, through postgraduate Masters degree students; to service general practitioners, and newly appointed or not so newly appointed clinical academics. Research runs in the bloodstream of a fortunate few in academic general practice, but others may not be so lucky. On the one hand, clinical practice can throw up so many uncertainties that endless questions can present themselves. These are not necessarily all researchable though, and choosing a tightly focused question can be a difficult and elusive goal. However, when confronted by the need to do a research project (for example as part of a Masters degree), some may find it very difficult to think of anything that appears 'worth' researching. We have found in relation to our own Masters in General Practice program at King's College London how important it is to provide constructive support and encouragement for postgraduate students at this critical phase in their research careers.

Correspondence: Professor Roger Jones MA DM FRCP F MedSci FFPHM, Wolfson Professor of General Practice, Department of General Practice & Primary Care, GKT School of Medicine, 5 Lambeth Walk, London SE11 6SP, United Kingdom.
Email: roger.jones@kcl.ac.uk

Accepted for publication 6 May 2002.

Getting started

The origins of research questions are numerous, and include:

- personal clinical experience
- the recognition of research gaps when engaged in audit or guideline development
- reading the literature, where a stimulating editorial or a particularly arresting original paper immediately suggests further research
- involvement in policy development, when evaluation of new services or methods of working becomes particularly important.

In my own case, as a new entrant to general practice, I was struck by the fact that as a hospital doctor, intimate examinations on female patients were always conducted in the presence of a chaperone. This was rarely the case in general practice consultations. I decided to explore womens' and doctors' views, attitudes and expectations of pelvic and other examinations, and was able to publish two influential papers about chaperones,[1,2] each based on a simple postal questionnaire survey.

In another instance, while trying to develop dyspepsia guidelines which I hoped would improve practice, I became aware of many gaps in the research literature. This stimulated my own research, particularly into patients' reasons for consulting their general practitioner, patients' health beliefs about dyspepsia and the value of early endoscopy (especially a negative endoscopy), in the initial work-up of dyspeptic patients.[3] I can still remember reading van Buchem's Lancet paper about the need or otherwise for antibiotics in otitis media and determining to undertake my own trial of antibiotic treatment in general practice.[4,5]

The question in a broader context

The research question does not, of course, exist in a vacuum. There are important intellectual, financial, institutional and organizational contexts in which research questions get asked and answered. The intellectual milieu, including the research literature as well as the level of research interest in a given topic, is likely to be particularly important, especially in relation to the chances of the research project getting funded. Research relevant to current clinical challenges or government policy is much more likely to receive financial support than 'blue skies', unrelated research. The choice of a research question is also influenced by the institutional context in which the research is undertaken; medical research groups in all disciplines are increasingly focusing on specific themes, and research that does not fall within a departmental research strategy may be difficult to 'sell'. Finally, organizational factors are important, particularly in relation to the feasibility of research and issues such as recruitment, patient numbers and professional contact. Researchers lucky enough to have access to primary care research networks are much better placed to recruit large cohorts of patients than more isolated researchers for whom contact with other medical professionals represents more of a challenge.

Testing the question

This is critical, not least because many researchers are simply too close to their research to see it, objectively, for what it is. Edward Huth, a distinguished editor of the Annals of Internal Medicine, recommended two crucial tests of any research question:

- the 'who cares?' test
- the 'so what?' test.[6]

The 'who cares?' test involves presenting your research idea to trusted colleagues and obtaining their reaction to its likely relevance, utility or interest. Candid responses at this stage, particularly if the question fails the test, can save much work and disappointment at a later stage. The 'so what?' test is also important because it involves considering the implications of your research, when it is completed. Again colleagues can help with this, and if the study that you have conceived is likely to do no more than satisfy your own intellectual curiosity, it may be worth thinking about how potential fund providers of this research would regard work unlikely to produce a useful message.

Refining the research question

This is the next stage, and can take place in at least four ways.

- First, the essential literature review will provide information about the extent to which the topic has been previously researched and may confirm or refute the novelty of your own question. The question itself may need to be re-phrased to fit more clearly with the required next steps in researching your topic of interest.
- Second, asking questions from colleagues and checking on current research using methods such as national research registers may provide further information about current research in your area of interest, and possibly avoid duplication of research effort.
- Third, writing the protocol is certain to sharpen up your ideas about your research – there is nothing like the challenge of a blank sheet of paper and the need to write a one-sentence hypothesis to focus the mind.
- Finally, most research requires a supervisor and it is likely that during the early stages of setting up a research project your supervisor will have something to say about your research question.

Criteria to help assess your research

This process of refinement must also ensure that, as well as being clear, the research question is answerable. This means that many research questions, often beginning as huge, potentially world-changing ideas, need to be trimmed extensively so that they become achievable within available time and resource constraints, and also predicate a research methodology capable of providing a meaningful answer. In practice this means that the distillation of the research question will need to go through several iterations, often beginning with a number of aims and objectives, and gradually honing down on a single question. Ideally there will also be a single, principal end point for analysis, with the possibility of including other, secondary outcomes and end points.

Assessment criteria that you and your supervisor might apply to your research include novelty, relevance and impact, feasibility, fundability, publishability and ethical issues.

Novelty is important and at this stage you will have ensured that you are not repeating a study that has already been done, although replicating a secondary care study in a primary care setting may be entirely legitimate and valuable. You will also, by applying the 'who cares?' and 'so what?' tests have tested the topic for *relevance and likely impact*. You need to be certain about this because many grant applications require a summary of the research written for a lay readership, and you will have to be quite clear about what your research is going to achieve and why public money should be devoted to supporting you. *Feasibility* is something that many researchers have difficulty with, because a good deal of experience is needed to determine all the resources – money, personnel and especially time – that will be required for the successful completion of a research project. Your supervisor should be able to help and if there is doubt about issues such as recruitment rates or questionnaire response rates a pilot study may be extremely informative. *Fundability* is important – all research costs money and properly funded research is likely to be more effective than an under-funded project. Many funding bodies operate entirely in 'response mode', where all applications within their sphere of interest and influence are considered. Others, particularly government funding agencies, operate in commissioning mode as well. This means specific topics are identified as the basis for funding applications. An awareness of funding opportunities, whilst not necessarily preceding the research question, is important in shaping it. Similarly, *publishability* needs to be considered and is linked to the responses to the 'who cares?' and 'so what?' tests. Clinically or policy-relevant, well-conducted research will usually find a home in the literature, and an appropriate target journal can often be identified in the early stages of a research project. Finally, *ethical issues* are increasingly important, particularly in relation to patients' rights to confidentiality, information and autonomy, in relation to data protection and also in relation to conflict of professional interests. Your local research ethics committee will have guidance on this; most journals now require a statement that ethics committee approval for the study has been obtained, and potential ethical pitfalls need to be discussed with your supervisor sooner rather than later.

Conclusions

Getting the research question right is an essential, although not always straightforward, step in any research project. Settling on a research question is often difficult to do in isolation, so that obtaining advice from experts and colleagues, collecting information from the literature and developing an awareness of the context in which your research is likely to be undertaken will all contribute to a successful outcome.

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