

Understanding research

This new series of articles about research is aimed at those people who have not undertaken formal education in research appreciation but who wish to understand the concepts underpinning research design and the interpretation of findings. The series will start with a description of what research is and the different philosophies which influence study design. As the series progresses, it will consider levels of evidence and discuss factors to be considered when designing a research study and interpreting the findings, such as validity, reliability and sample selection.

What is research?

Research has been defined as a diligent, systematic inquiry or investigation to validate and refine existing knowledge and generate new knowledge (Burns and Grove, 2001). This definition captures the essence of research as it recognises that not only is it concerned with the generation of new knowledge but also the validation of existing knowledge, through a planned process. Research is borne out of some form of enquiry: 'Why is this happening?', 'How can this be treated?', 'Can treatment be improved upon?', 'What effect does this have on the individual, the health service or society?' As the term implies it is to search and search again 're'-search. It should not be confused with a literature review which aims to synthesise a body of knowledge on a particular issue, nor should it be confused with audit which seeks to compare current practice with some defined standard.

Qualitative vs quantitative research

Two methodologies exist to generate this knowledge: qualitative and quantitative research. Qualitative studies aim to describe and promote understanding of human experiences such as pain, caring and comfort (Burns and Grove, 2001). The philosophical base of qualitative research is interpretive, humanistic and naturalistic and is concerned with an understanding of the meaning of social interaction by those involved (Burns and Grove, 2001). For example, a study by Rich and McLachlin (2003) looked at the effects of leg ulceration on people's daily lives using qualitative methodology. This study determined that leg ulceration had a major impact on the lives of the eight participants particularly in relation to pain, odour, and emotions. As demonstrated, the sample size for this study was small (as is often the case with qualitative studies) but as the findings are obtained at a specific point in time, the study cannot be replicated and the findings cannot be generalised to other settings (Parahoo, 1997). The data from qualitative studies takes the form of words and are analysed in terms of individual responses or descriptive summaries or both (Burns and Grove, 2001). Qualitative studies recognise the diversity of human experience and seek to give voice to these experiences.

Quantitative research emerges from a branch of philosophy called 'logical positivism' which operates on strict rules of logic, truth, laws and predictions (Burns and Grove, 2001). It is described as the manipulation of numerical data through statistical procedures for the purpose of describing phenomena or assessing the magnitude and reliability of relationships between them (Polit and Hungler, 1995). Furthermore, quantitative studies seek to compare and contrast treatment regimens looking for differences using a scientific and robust approach to data collection and are often used in wound care (Baxter 2001). An example is a recent study which aimed to determine the efficacy of Manuka honey as a

desloughing agent in comparison to hydrogel (Gethin and Cowman, 2008). As wound management is often concerned with effect and efficiency one is more likely to encounter these types of studies within the literature.

Choosing a research method

Any research study must commence with a clear, well-defined, answerable question. For example: 'What are the effects of having a pilonidal sinus on the quality of life of the individual?', 'What proportion of the acute hospitalised patient population have a pressure ulcer?', 'What effect has the application of compression therapy on healing rates of venous leg ulcers?'. It is clear from each of these examples that a different research design is required to answer the different questions. The design should match the objective of the study in order to reduce the possibility of introducing bias and improve the quality of the findings. Realising the appropriateness of the research design is more important than arguing that one design is better than another.

Most research studies and reports will start with a literature review. The literature review seeks to gain an understanding of the current knowledge on a topic and identify gaps in the knowledge that would be suited to a research study. Essentially if the answer is known it may be unethical to conduct the study again. The premise being that it would be improper or unethical to subject patients to a study in which the outcome is already known. However, an exception to this may be considered if the original study was too small or to retest the hypothesis in another setting. When one is searching databases it is important to be specific about what is required. Using the word 'infection' will yield thousands of hits. However, by limiting the search to 'identification' and 'acute wounds' the results are narrowed considerably. Consider how far back in the literature you want to search. This may depend on the question you are

seeking to answer: Will the search be limited to English language? Or to articles only published in peer-reviewed journals? When reading any research paper the reader must be convinced that the author has presented the current knowledge on the topic and identified the need for the study. The literature review together with the research question will guide the choice of research design.

Study outcomes

Having identified the need for the study and the question to be answered, an often poorly documented component is whether the study outcomes have been clearly defined. What will the study produce and how will one measure if the study has been a success or failure? In qualitative studies these are more ambiguous than in quantitative studies as the researcher aims to gain an understanding of the phenomena rather than produce outputs in measurable terms. Nelson and Bradley (2007) argue that in wound healing studies, complete healing is definitive, measurable and likely to be the outcome of interest to patients and should be the primary outcome of any treatment. However, one could argue that this is not always practical in chronic wounds when healing may take many months. Furthermore, in assessing the effectiveness of debriding agents, for example, Enoch and Price (2004) maintain that it does not seem appropriate to use wound closure as an endpoint as the aim of debriding is not to achieve complete healing, but to stimulate the process and facilitate

wound closure. Trials involving chronic wounds need to have endpoints tailored according to the specific action of dressings or devices rather than using 'healing' as a blanket endpoint for all trials (Enoch and Price, 2004).

The primary outcome is the main event or condition that a trial was designed to evaluate (Jadad, 1998). Potential endpoints in wound healing include: percentage of patients healed, time to complete healing, percentage change in wound area, absolute change in wound area, total area healed and mean adjusted rate of healing (Price, 1999). In reviewing randomised controlled trials in dermatology Naldi and Minelli (2004) argue that most outcome measures are soft endpoints involving subjective judgement. To reduce the likelihood of subjective assessments, validated tools should be used and, in addition, the tools used to assess the outcomes should be specified (Jadad, 1998). These will be discussed in the next issue. The randomised controlled trial is often termed the 'gold standard' of studies which aim to determine cause and effect relationships. This is because it reduces the possibility of the results occurring by change and the possibility of bias as patients are randomly allocated to each of the treatment groups. It is not without its challenges and the RCT will be discussed together with other study designs in part three.

Georgina Gethin is Lecturer, Research Centre, Faculty of Nursing and Midwifery, Royal College of Surgeons in Ireland, Dublin

In the next article in the series, variables, data collection tools and explanation of different types of quantitative studies will be reviewed. **WUK**

References

- Baxter H (2001) Understanding research: 1 Methodologies used to answer research questions. *J Wound Care* 10(7): 269–72
- Burns N, Grove S (2001) *Nursing Research, Conduct, Critique and Utilization*. Saunders, Pennsylvania
- Enoch S, Price P (2004) 'Should alternative endpoints be considered to evaluate outcomes in chronic recalcitrant wounds?' *World Wide Wounds* www.worldwidewounds.com
- Gethin G, Cowman S (2008) Manuka honey vs Hydrogel, a prospective, open label, multicentre randomised controlled trial to compare desloughing efficacy and healing outcomes in venous ulcers. *J Clin Nursing* Aug 23. (Epub ahead of print) August 23
- Jadad A (1998) *Randomised Controlled Trials*. British Medical Journal Books, London
- Naldi L, Minelli C (2004) Dermatology. In: Machin D, Day S, Green S eds. *Textbook of Clinical Trials*. Wiley, Sussex
- Nelson EA, Bradley MD (2007) Dressings and topical agents for arterial leg ulcers. *Cochrane Database Syst Rev* 24(1):CD001836
- Parahoo K (1997) *Nursing Research, Principles, Process and Issues*. MacMillan, London
- Polit DF, Hungler BP (1995). *Nursing Research: Principles and Methods*. J B Lippincott, Philadelphia
- Price P (1999) The challenge of outcome measures in chronic wounds. *J Wound Care* 8(6): 306–8
- Rich A, McLachlan L (2003) How living with a leg ulcer affects people's daily life: a nurse-led study. *J Wound Care* 12(2): 51–4

If you would like your question about research to be answered in 'Understanding research', please send an email entitled 'Research' to rebecca.harrington@wounds-uk.com