

Evidence, research and diabetes nursing

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INTRODUCTION

This article considers the implications of the current drive for evidence-based practice and what constitutes evidence. The range of research designs from completely quantitative to qualitative approaches are outlined and the implications of these designs for the generation of evidence are discussed. Subsequent articles during the year will focus on specific research designs across the spectrum of quantitative and qualitative approaches and will look at how they have been applied to the management of people with diabetes.

LEARNING POINTS

- There is great debate about what counts as evidence, from research through to experience.
- Research can be considered across a range of designs from experimental (which is completely quantitative) through to non-experimental approaches, such as single case studies and narratives.
- Where possible, decision-makers need to be able to produce evidence to support their decisions.
- The government support an evidence-based approach to care and enhance ways for available evidence to be readily located.

In the current healthcare climate all healthcare practitioners are urged to base practice on evidence or at least have practice informed by evidence. At the same time there is great debate about what counts as evidence from research through to experience. Where evidence is to be derived from research there is further controversy about which research designs generate acceptable sources of evidence. Research can be considered across a range of designs from experimental (which is completely quantitative) through to non-experimental approaches such as single case studies and narratives.

The culture of evidence based practice

Hicks and Hennessy (1997) state that:

'The current ideology of open accounting, cost effectiveness, efficiency targets and audits means that it is no longer acceptable to deliver care that cannot be justified on proper empirical grounds'

Healthcare decisions were conventionally driven by individual or group opinion, but it is now recognised that there are several important limitations to this approach to decision making. For example, Williams and colleagues (2002) point out that:

'Historically, such (healthcare) decisions have been taken in a rather unsystematic manner, leading to variation in the quality of care, the persistence of practices for which there is little evidence and the slow introduction of new interventions that have been demonstrated to be effective.'

This situation is changing. The decision

making process must now be much more transparent. Decisions are often open to scrutiny and those who make decisions need to be able to justify them. Where possible, decision-makers need to be able to produce evidence to support their decisions. This evidence needs to be evaluated, although it is also clear that decisions are still affected by personal beliefs and by availability of resources (Muir Grey, 1997).

The changing culture of healthcare is reflected in the world of diabetes as can be seen in the increasing numbers of research-based articles on diabetes. The publication of books such as *The evidence base for diabetes care* (Williams et al, 2002) and the increasing number of research-based articles on diabetes nursing, demonstrated through the expanded production of *The Journal of Diabetes Nursing*, illustrates the impact that evidence-based practice is having on diabetes care.

There is now such a wealth of research that it can be difficult for busy practitioners to locate and discern what is most relevant for their practice. This is recognised by the government who support an evidence-based approach to care and enhance ways for available evidence to be readily located, and its quality appraised for rapid consumption by practitioners. In particular, NICE produces guidance for both the NHS and patients on the use of medicines and clinical interventions and when and how they should be used. To produce this guidance NICE looks at how well the medicine or intervention works and how well it works in relation to how much it costs through a process known as an

appraisal (NICE, 2003a). Topic appraisals published by NICE may offer clinical staff a source of evidence for practice.

The recent appraisal entitled *Guidance on the use of patient-education models for diabetes* (NICE, 2003b) can be used to support the need to prioritise time and resources to enable all people with diabetes to participate in a structured patient education programme at the time of diagnosis and then, depending on regular assessment of need, to have ongoing education. However, the appraisal report also points out that many of the reported research studies on patient education were flawed or had weaknesses in their design which meant that they were excluded from the appraisal. It is valuable for nurses to be aware that in the eyes of the NICE Committee many of the published studies were not deemed sufficiently robust to be considered as providing evidence for practice.

Evidence may also be retrieved from other databases such as, the Health Technology Assessments and the Cochrane Reviews. However, there are still a vast number of practical nursing topics which have not been subjected to such a process. The onus is then on practitioners to justify their decisions, if possible through reference to evidence.

Evidence

We all use a wide range of sources to inform the care we give:

- Personal experience
- Advice from a respected colleague
- Information from a course, study day or conference

However, the term 'evidence-based' implies the use and application of research evidence (Humphris, 1999), which rests on the assumption that there is available research evidence, that it can be located and that it is credible. This is often not the case. While we are frequently faced with a huge volume of published research, Humphris (1999) states that:

'...the scarcity of credible evidence compounds the difficulty faced by clinicians when attempting to make decisions about which evidence to use.'

Hundreds of papers are published about diabetes every month. There is an overwhelming volume of written material, but

Class	Strength of evidence
I	Strong evidence from at least one systematic review of multiple well-designed randomised controlled trials.
II	Strong evidence from at least one properly designed randomised controlled trial of appropriate size.
III	Evidence from well-designed trials without randomisation, single group pre-post, cohort, time series or matched case-controlled studies.
IV	Evidence from well-designed non-experimental studies from more than one centre or research group.
V	Opinions of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees.

how much of this can provide good quality evidence for nursing interventions? It is fair to say that where research exists it should be considered as potentially providing the most suitable form of evidence. The Department of Health (1993) defined research as:

'Rigorous and systematic enquiry conducted on a scale and using methods commensurate with the issues investigated and designed to lead to generalisable contributions to knowledge.'

It is the systematic approach to the generation of knowledge that makes it a more robust form of evidence than other sources.

Appraising evidence

For individuals who make healthcare decisions about patients and populations Muir Grey (1997) suggests that:

'Every decision will have to be based on a systematic appraisal of the best evidence available.'

This development will put staff under further pressure to justify decisions, both by having to locate available evidence and by having to appraise it. One scheme for assessing evidence of research-based papers has been termed as 'a hierarchy of evidence' and is shown in *Figure 1*.

Assuming the research study has been carefully conducted and has produced results that are credible, this hierarchy of evidence endows the most experimental designs with greater credibility than any other design. The hierarchy is a helpful guide to illustrate those research designs which are most robust and reproducible but it is probably more useful to medicine which is based on a biomedical model of care. As nursing is based on a holistic approach to care there is also a place for research that gives greater insights into individuals and groups rather than relying only

Figure 1. A hierarchy of evidence. Reproduced from: Evidence-based health care. How to make health policy and management decisions. Muir Grey JA (1997). Permission from Elsevier Science Ltd.

LEARNING POINTS

● 'Evidence-based' implies the use and application of research evidence (Humphris, 1999), which rests on the assumption that there is available research evidence, that it can be located and that it is credible.

● Research is rigorous and systematic enquiry conducted on a scale and using methods commensurate with the issues investigated and designed to lead to generalisable contributions to knowledge.

● The hierarchy of evidence is a helpful guide to illustrate those research designs which are most robust and reproducible.

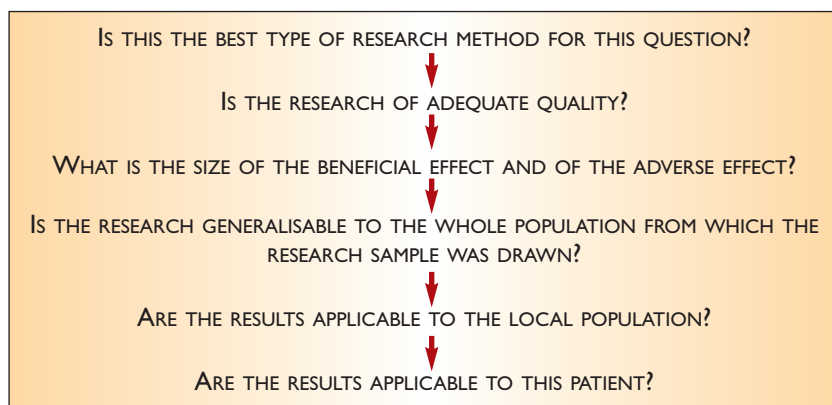


Figure 2. Appraising evidence. Reproduced from: Evidence-based health care. How to make health policy and management decisions. Muir Grey JA (1997). Permission from Elsevier Science Ltd.

not, however, always applicable to the types of inquiry that nurses may need to pursue. As Abbott commented in 2002:

'In particular there has been concern that quantitative methods treat patients as objectives to be worked on, rather than people to be worked with.'

Qualitative research

The other philosophical approach is that of qualitative research in which understanding rather than measurement is the key. Qualitative research seeks to describe and interpret human experience to provide insights or possibly to challenge current views and perceptions of social situations and human experience. Qualitative research does not aim to investigate a situation in isolation but tries to look at a situation or phenomena as a whole. As such it has a completely different philosophical basis to that of quantitative research.

It should be noted that in some cases it is appropriate to use a combination of research approaches and methods to address a clinical issue. For example, Cooper et al (2003) used a dual methods approach involving a randomised controlled trial design and also focus group discussion to explore an educational intervention designed for people with type 2 diabetes.

Putting it into practice

Measurement is crucial in quantitative research but irrelevant in qualitative research. All further research design issues are affected by this basic philosophical difference. The distinction is clearly explained by Parahoo (1997) who points out that there are at least two sides to human phenomena. One is an objective view of life which can be observed and captured by others, and the other is a personal, subjective experience of life, or an aspect of life, which does not claim to be measurable, reproducible or quantifiable by others. Both perspectives may contribute to our understanding of life with diabetes and both are valuable approaches for nurses to take. For example, a quantitative approach is likely to be most appropriate if the investigator wishes to measure the effects of two different oral medications. However, if we want to learn the patients' views of taking the tablets and how they perceive that they affect

on results (evidence) from anonymous, randomised, group interventions. Nurses need to be aware of the hierarchy of evidence but also remember that results of a randomised controlled trial may still not identify the most suitable intervention for an individual patient in their care.

Another way to consider what is the best available evidence is by considering the merits of the research study itself. There are numerous ways in which to appraise a study, one of which is shown in Figure 2. These questions offer a means of appraising research studies, not only for the quality of the work itself but also regarding their suitability to be applied in practice. As such they provide a valuable means of appraisal. While they appear to address issues particularly relevant to quantitative work they can still be usefully applied to qualitative research.

Quantitative and qualitative research approaches

Research is underpinned by a philosophical approach or paradigm. In healthcare the two major philosophical traditions are quantitative and qualitative research.

Quantitative research

Quantitative research is based on scientific methods in which definable, identifiable facts can be measured and quantified. Such research often involves a hypothesis, which can be systematically tested. This approach has been the predominant form of inquiry in nursing over the years and was thought by some to be the most scientific and suitable method of advancing nursing knowledge (Parahoo, 1997).

While this approach is valuable in situations where the topic for investigation can be isolated, defined and measured, it is

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● Quantitative research is based on scientific methods in which definable, identifiable facts can be measured and quantified.

● Qualitative research seeks to describe and interpret human experience to provide insights or possibly to challenge current views and perceptions of social situations and human experience.

● Measurement is crucial in quantitative research but irrelevant in qualitative research and all further research design issues are affected by this basic philosophical difference.

● Both quantitative and qualitative perspectives may contribute to our understanding of life with diabetes and both are valuable approaches for nurses to take.

SYSTEMATIC REVIEW, RANDOMISED CONTROLLED TRIAL, SURVEY, OBSERVATION, INTERVIEW, FOCUS GROUP CASE STUDY, NARRATIVE

QUANTITATIVE RESEARCH APPROACH

QUALITATIVE RESEARCH APPROACH

their lifestyle then a qualitative approach may be more suitable. It may also be considered appropriate to combine methods and include a trial of the efficacy of the drug plus a qualitative exploration of patients' views of the medication. Over the years the relative merits of each research approach has been debated but the general consensus in nursing is that either approach is acceptable depending on the research question to be addressed.

If this continuum of research is applied to the hierarchy of evidence shown in *Figure 1* it can be seen that the most highly ranked scientific evidence is at the most quantitative extreme of the continuum through to qualitative research towards the other. Thus in many circles qualitative research is not considered to produce evidence which is as powerful as that generated by quantitative work.

Quantitative and qualitative research embraces a variety of research designs and data gathering methods. These underpinning philosophies (paradigms) must be considered as approaches to research rather than as specific designs or methods of gathering data. For example, within quantitative approaches, randomised-controlled trials, surveys and non-participant observation may be used to gather data. While in qualitative research in-depth interviews, focus groups, case studies, unstructured observation and narratives can be employed. *Figure 3* shows the quantitative to qualitative progression of designs and methods.

Methods such as interviews and observation can be applied (in quite different ways) to both quantitative and qualitative paradigms. An interview in a quantitative study would depend on a structured questionnaire designed before data gathering and all participants would be asked the same questions. Responses would be coded according to fixed pre-determined responses. In qualitative research an interviewer may have only a list of topic areas to be covered, or possibly one initial question to get the participant started and then the participant would be free to

respond without restriction. Thus the data would be quite different to that gained from a structured method. In some interviews in qualitative research the questions to be asked evolve as the study develops. Individuals interviewed at the start of the study would probably not be asked the same questions as those asked at the end. This would be unthinkable in a quantitative study. Similarly observation can be a method used in both quantitative and qualitative research although the design of the study and the data-gathering instruments would be quite different.

Conclusion

Although many nurses working in diabetes are unlikely to conduct research themselves it is crucial that they are all able to use research to inform practice. Most of the so-called 'landmark studies' such as the DCCT (1993) and the UKPDS (1998) are widely known and are universally regarded as providing gold standard evidence. However, the large multicentre randomised controlled trials usually focus on physical aspects of treatment and prescribing and may be more immediately relevant to physicians. Nurses however, need to support their own repertoire of interventions which may not be pharmacologically driven, such as: patient education; patient and family support; the effects of culture on self-management; continuing professional development of colleagues; or integration of multiprofessional and primary and secondary care services. The evidence to support these types of interventions is often not so clear cut or accessible. Nonetheless nurses working in diabetes need to be able to locate such research where it exists and appraise its suitability for application to their own area of practice.

In the following months a new series of papers will be published in the *Journal of Diabetes Nursing*. Research studies with different designs and methods will be considered using the questions listed in *Figure 2* to help clarify how they influence the quality of the evidence produced. ■

Figure 3. Quantitative to qualitative progression of designs and methods.

- Abbott P (2002) Implementing evidence-informed nursing. In: McSherry R, Simmons M, Abbott P (Eds) *Evidence-informed nursing. A guide for clinical nurses*. Routledge, London
- Cooper H, Booth K, Gill G (2003) Using combined research methods for exploring diabetes patient education. *Patient Education and Counseling* 51: 45-52
- DoH (1993) *Report of the taskforce on the strategy for research in nursing, midwifery and health visiting*. Department of Health, London
- Diabetes Control and Complications Trial Research Group (DCCT) (1993) The effects of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *The New England Journal of Medicine* 329(14): 977-86
- Hicks C, Hennessy D (1997) Mixed messages in nursing research: their contribution to the persisting hiatus between evidence and practice. *Journal of Advanced Nursing* 25: 595-601
- Humphris D (1999) Types of evidence. Published in: *Achieving evidence-based practice. A handbook for practitioners*. Hamer S, Collinson G (Eds) Baillière Tindall/ Royal College of Nursing, Edinburgh
- Muir Grey JA (1997) *Evidence-based health care. How to make health policy and management decisions*. Churchill Livingstone, Edinburgh
- National Institute for Clinical Excellence (2003a) *A guide to NICE*. NICE, London
- National Institute for Clinical Excellence (2003b) *Guidance on the use of patient-education models for diabetes. Technology Appraisal 60*. NICE, London
- Parahoo K (1997) *Nursing research. Principles, processes and issues*. Macmillan Press, London
- UK Prospective Diabetes Study (UKPDS) Group (1998) Effect of intensive blood-glucose control with metformin on complications in overweight patients with Type 2 diabetes (UKPDS 34). *The Lancet* 352: 854
- Williams R, Herman W, Kinmonth A-L, Wareham NJ (2002) *The evidence base for diabetes care*. John Wiley & Sons, Chichester