

Barriers to evidence-based practice in primary care nursing – why viewing decision-making as context is helpful

Carl Thompson DPhil RN

Senior Research Fellow, Department of Health Sciences, University of York, York, UK

Dorothy McCaughan MSc RN

Research Fellow, Department of Health Sciences, University of York, York, UK

Nicky Cullum PhD RN

Professor, Department of Health Sciences, University of York, York, UK

Trevor Sheldon DSc

Professor, Department of Health Sciences, University of York, York, UK

Pauline Raynor PhD RN

Research Fellow, Department of Health Sciences, University of York, York, UK

Accepted for publication 25 January 2005

Correspondence:

Carl Thompson,
Department of Health Sciences,
University of York,
Area 2,
Seebohm Rowntree Building,
York,
North Yorkshire,
YO10 5DW,
UK.
E-mail: cat4@york.ac.uk

THOMPSON C., McCAUGHAN D., CULLUM N., SHELDON T. & RAYNOR P. (2005) *Journal of Advanced Nursing* 52(4), 432–444

Barriers to evidence-based practice in primary care nursing – why viewing decision-making as context is helpful

Aim. This paper reports a study examining the barriers associated with research knowledge transfer amongst primary care nurses in the context of clinical decision-making.

Background. The research literature on barriers to nurses' use of research knowledge is characterized by studies that rely primarily on self-report data, making them prone to reporting biases. Studies of the barriers to evidence-based practice often fail to examine information use and behaviour in the context of clinical decision-making.

Methods. A multi-site, mixed method, case study was carried out in 2001. Data were collected in three primary care organizations by means of interviews with 82 primary care nurses, 270 hours of non-participant observation and 122 Q-sorts. Nurses were selected using a published theoretical sampling frame. Between-methods triangulation was employed and data analysed according to the principles of constant comparison. Multiple linear regression was used to explore relationships between a number of independent demographic variables (such as length of clinical experience) and the dependent variable of nurses' perspectives on the barriers to their use of research knowledge.

Results. Three perspectives on barriers to research information use emerged: the need to bridge the skills and knowledge gap for successful knowledge transfer; information formats need to maximize limited opportunities for consumption; and limited access in the context of limited time for decision-making and information consumption. Demographic variables largely failed to predict allegiance to any of the perspectives identified.

Conclusions. Researchers should consider using decision-making as a contextual backdrop for exploring information use and behaviour, avoid relying solely on self-reported behaviour as data, and use a variety of research methods to provide a richer picture of information-related behaviour. Practice developers need to recognize that understanding the decisions to which research knowledge is to be applied should be a characteristic of any strategy to increase research uptake by nurses.

Keywords: barriers, clinical decision-making, evidence-based practice, nurses, Q-methodology, research, utilization

Introduction

Policy and professional expectations that nurses will use the best available evidence in their clinical decision-making (Department of Health 1999, Royal College of Nursing 2003) have intensified in recent years. Nurses are increasingly seen as *active* decision-makers exercising clinical judgement in conditions of irreducible uncertainty (Eddy 1990, Department of Health 2003). Despite extensive exposure to the policy message that research knowledge is useful for clinical practice, the extent to which research knowledge is transferred to clinical practice in nursing remains unclear.

Background

Despite a lack of conceptual clarity (Estabrooks 1999), many studies examine what stops nurses utilizing research findings (Funk *et al.* 1995, Dunn *et al.* 1998, Parahoo *et al.* 2000, Retsas 2000, Griffiths *et al.* 2001, McKenna *et al.* 2004). Often these studies focus on self-reported 'information-behaviour' (Case 2002) using questionnaires such as the BARRIERS scale (Funk *et al.* 1991). Studies using combinations of observational and self-report methods have exposed the over-reporting and mis-reporting of biases (Covell *et al.* 1985, Cogdill 2003) associated with recalled information-use. This finding that should not cause surprise, given the unreliable nature of recalled decisions in other areas of social life (Gladwell 2005). Studies examining judgement and decision-making in nursing often neglect information-behaviour (Field 1987, Bautista & Deber 1989, Orme & Maggs 1993, Bucknall & Thomas 1997, Cioffi 1997, Lauri & Salantera 1998, Chumblor *et al.* 2000, Girot 2001, Offredy 2002). Studies combining information-behaviour and decision-making (Kenrick & Luker 1996, Hallett *et al.* 2001, McCaughan *et al.* 2002, Cogdill 2003) reveal that research-based decisions remain an elusive goal for many nurses.

In this paper we examine the barriers to nurses' research information-use in the context of clinical decision-making. We argue that knowing more about the decisions nurses

make as a context for research knowledge-transfer helps explain why research-based decision-making appears so uncommon.

The study

Aims

The aim of the study was to examine the perceived barriers and obstacles to accessing and using research-based information.

Design

The data reported here form part of a bigger research project examining the potential for evidence-based decision-making by primary care nurses. A three-site (plus one pilot) case study design (Yin 1994) with mixed, embedded, methods of data collection: interview, non-participant observation and Q-methodological modelling. As clinical decision-making is a social activity (Thompson *et al.* 2001a) it is ideally suited to case study. The method provides the ideal strategic choice when researching, 'decisions associated with complex social action', especially in organizational settings (Yin 1994).

Sample

There were three separate sampling approaches in the study:

- Selection of the cases, i.e. the primary care organizations – all were in the North of England in locations containing acute hospitals that were the focus of previously published investigations of the information behaviour of acute care nurses (Thompson *et al.* 2001a,b, McCaughan *et al.* 2002). Details of the sites are presented in Table 1.
- Purposive sampling for qualitative data collection – a sampling frame was designed (Thompson 1999b, Thompson *et al.* 2004) to identify those informants most likely to enable the exploration of information-behaviour in the context of decision-making. The sampling frame was based

Table 1 Case site characteristics

Case site features	Case site 1	Case site 2	Case site 3
General information	1 Primary Care Trust Population: 276,000 General practices: $n = 47$	2 Primary Care Trusts Population: 550,000 General practices: $n = 60$	1 Primary Care Trust Population: 275,000 General practices: $n = 36$
Research and Development strategy	Research and Development manager in post to develop research strategy aimed at developing a research conscious workforce; increasing research capacity and developing quality services through research	Themed research programmes (e.g. mental health, health promotion, older people). Primary care, community care and nursing programme led by a nurse who also held a high level academic position	Research activities were focused in seven main areas of care, including coronary rehabilitation, elderly care, mental health and interventions in diabetes
National Health Service Research and Development Support Funding	An indicative budget of £66,000 was linked to four areas of activity; £55,000 was allocated to research development, including training	An indicative budget of £216,000 for Research and Development activity (2001–2003), including £32,000 for capacity building, with available funding and protected time for wide ranging staff training in research awareness and activities.	An indicative budget of £138,000 was linked to the seven main areas of research activity. Training programmes included IT and research skills for all staff, although available funding was limited
Nurses' role in Research and Development committees	Lead for research in the trust was a General Practitioner One of the nurses interviewed was a Trust board member	Head of Research and Development in the trust supported by 2 Research & Development coordinators, one of whom was a nurse.	Nurses were not active in these positions in the trust
Practice Development Structures	Trust-wide Professional Nurse Forum in place No professional lead for practice nursing	Nursing research support unit had been established to promote evidence-based practice; funding had recently been withdrawn	New post had recently been created for a Practice Development Lead in Practice Nursing (unfilled at time of data collection)
Library Provision	Access to library and Information Technology facilities via 2 Learning Centres and a Resource Centre based in local hospitals	The trust had a number of remote library sites, provided literature-searching training and employed a librarian to assist staff.	All nurses could use the hospital library, linked to the local university library. 'Drop-in' information and searching sessions had recently been withdrawn
Practice-based Information Technology	Access to Internet and databases available in 12 out of 13 practices where data collection took place	Access to Internet and databases available in all practices where data collection took place	Access to Internet and databases available in all practices where data collection took place
Links with local universities	Strong links with local university to promote joint educational programmes and research activities. Nurses able to access training in computer and database use. Joint academic/trust posts in nursing	Strong links: joint academic and trust posts developing primary care and nursing research. Trust member of a local R&D consortium in partnership with the local university and National Health Service hospitals trusts	Links to local university for undergraduate and postgraduate nursing education and an extensive range of Continuing Professional Development courses Collaborative research links not well developed

on the following variables present in the nurses' in the case sites: cultural (had the nurse been involved in conducting research), environmental (the nurse's clinical setting), internal decision-maker (the nurse's educational level and clinical experience) and information-based (the presence or absence of computerized information resources in settings) (see Table 2 for examples). A questionnaire was sent by post to every Registered Nurse or health visitor (public health nurse) in the case sites. Participants were chosen for interviews on the basis of their location in a matrix of theoretically significant categories which previous research literature had shown influenced decision-making, information-behaviour or both (Thompson 1999b).

- (a) *P-sample for Q-methodological modelling* – Q-methodology (Brown 1993) was used to model the shared perspectives of nurses about barriers to research based information use. Q-methodology adopts an ideographic

Table 2 Participant demographics

Variable	Frequency		
Post on primary care team			
Practice nurse	36		
District nurse	48		
Health visitor	26		
Clinical nurse specialist	3		
Nurse practitioner	3		
Other	3		
Research or management involved in post			
Yes	69		
No	50		
Training format			
State enrolled nurse	3		
State registered nurse	53		
Registered general nurse	38		
Project 2000 or diploma in nursing	10		
Degree in nursing	11		
Community-specific qualifications			
Practice nursing	10		
District nursing	31		
Health visiting	29		
Other	2		
Highest educational attainment			
General certificate secondary education or equivalent	41		
Advanced level general certificate of education	32		
Diploma	3		
Vocational qualifications	17		
Undergraduate	13		
Postgraduate	3		
Variable	<i>n</i> *	Mean	Standard deviation (SD)
Age	118	43	6.9
Years since registration	118	21	8.3
Years in specialty	118	8	6.1

*Three respondents failed to provide demographic information.

epistemological approach based on the Skinnerian belief that it is more informative to study one person for 1000 hours than 1000 people for 1 hour (Skinner 1969, p. 12). In Q-methodology, the individuals (whose perspectives are being modelled) are selected purposively and known as the P-sample (McKeowan & Thomas 1988). The questionnaire had already generated an information-rich sample in each of the sites. We therefore randomly selected participants from those who had already been observed and interviewed and those identified from the questionnaire. The P-sample was 'extensive' and designed to allow comparisons of 'intersubjectivity' between individuals (McKeowan & Thomas 1988, p. 37), comprising 122 participants. Each was assigned a unique number and a computer-generated random number list used to select those to be approached to complete the Q-sort. Q-sorts were posted to 180 nurses, and the 122 completing them gave a 67% response rate.

(b) *The Q-sample* – is a set of stimuli ($n = 67$, see Appendix A) representing the 'concourse', i.e. the views, opinions and beliefs about barriers to information use given in interview and observational data.

Both the Q and qualitative case studies were ideographic (Bowling 2002 p. 143) research approaches; consequently there was no need for formal statistical power calculations.

Data collection

Semi-structured interviews

In order to access informants' perceived information behaviour, 82 interviews were conducted. Each lasted approximately 1 hour and took place in a setting of the informant's choice. Interviews focused on the decisions made in practice, forms of information accessed, the role of information in decision-making and patient contact, the usefulness of information for decision-making and challenges to information use in the context of decision-making. Interviews were recorded on minidisk and fully transcribed.

Non-participant observation

Accessing observed information behaviour in the context of clinical decision-making meant undertaking 270 hours of non-participant observation. The sampling units were clinicians 75% ($n = 61$) of the 82 nurses interviewed were also observed. The mean observational period was approximately 4 hours. Our clinical background and non-participant status was made clear to the nurses and patients involved. Observing nurses we had previously interviewed made it possible to investigate both reported and observed information behaviour. The approach also minimized any 'reactive' effects (Bowling 2002, p. 363) by

using the interview and preinterview period for building rapport. Fieldnotes were recorded in notebooks and written up fully on returning to the research base.

Q-methodological modelling

Participants sorted the Q-sample by following the instructions below:

Sort the following statements from those which least represent your views on using research information in your clinical decision-making (−5 position) to those which most represent your views on using research information in your clinical decision-making (+5 position).

Q-sorts were then posted back to the principal investigator and entered into a text file before being imported into a specialist software package: PQ-method version 2.10 (<http://www.rz.uni-bw-muenchen.de/~p41bsmk/qmethod/index.htm>).

Piloting of data collection took place in a fourth (unconnected) site; only minor revisions to interview schedules were required.

Rigour and ‘trustworthiness’

A number of procedures were used to foster ‘trustworthiness’ (Sandelowski 1986) in data collection and analysis. Credibility was encouraged by a team-based approach to analysing data. As a record of data authenticity, we retained all transcripts. The Discussion section of this paper (and the final report) illustrates this study’s ‘fit’ with other studies examining barriers to evidence-based practice. Team-based coding, using a multi-rater version of the Kappa statistic, of key descriptive themes fostered auditability. The team achieved a Kappa score of 0.8 (SD = 0.2), indicating excellent levels of agreement (Maclure & Willett 1987). Disagreements in interpretation were resolved through discussion, the results of which can be seen in changes to Kappa over time (Thompson *et al.* 2004).

Ethical considerations

Four Local Research Ethics Committees approved the project. Written informed consent was gained from all nurses and patients. Patient consent was gained from via an approach from the nurse to be observed or via an information sheet provided by the receptionist at the practice.

Data analysis

Analysis was an iterative process using of the principles of constant comparison (Glaser 1992). The process was: (i) analyse interview data for descriptive and interpretative themes; (ii) collect and analyse observational data for stand-

alone themes before revisiting the interview and observational data (as we could now compare both reported and observed behaviour); (iii) adapt the interview schedule to challenge or further explore themes; (iv) undertake more interviews and then reanalyse, prior to further observation. This process was continued until no new themes emerged in each of the three sites. The Q-sort exercise was undertaken in all three sites simultaneously (after qualitative analysis) and the results analysed. Following the Q-analysis, interview and observational data were reanalysed bearing in mind the structure and form now revealed by the Q-data. Thus, the final analysis represented the triangulation of three datasets.

Principal components analysis with varimax factor rotation was used to reveal the Q-modelled themes using the PQ-Method software package. After checking that the assumptions underpinning ordinary least-squares regression were met (using scatter plots), we entered independent variables into a multivariate linear regression model [using SPSS v.10.0 (SPSS Inc, Chicago, IL, USA), stepwise method, entry criteria $P < 0.05$, exit criteria of $P > 0.1$]. Individuals’ factor loadings (i.e. their allegiance to the extracted perspectives) were the dependent variables. Where necessary, variables were entered into the model together as a way of controlling for interactions. The independent variables entered were: years of clinical experience; years of clinical experience in their specialty (e.g. district nursing, health visiting); post in primary care team; non-professional educational attainment; mode of professional preparation (e.g. diploma or degree). Distinguishing factor scores (and differences between factor scores) were reported as statistically significant where $P < 0.05$.

Results

Demographic data were available for 118 nurses. Thirty per cent were employed as practice nurses, 40% as district nurses, just less than a quarter were health visitors, and fewer than 5% were nurse practitioners. Fifty-eight per cent of informants had a research or management component as part of their role. Seventy-nine per cent had a vocational-style preparation for practice as the former State Enrolled, State Registered Nurse, or Registered General Nurse qualifications. Twenty-one per cent were diploma or degree educated. Fourteen per cent described themselves as having other graduate qualifications.

Participants described three distinct perspectives on the barriers to using research evidence in their clinical. However, running through each of these theoretically distinct perspectives was an overarching theme focusing on the role of time in information-behaviour.

The meta-theme of limited time

The perceived lack of time for information-seeking and use acted as a contextual backdrop for the three major themes identified in the data. Examining limited time in the context of other perceived obstacles revealed that the organization of work did not impact on either reported or observed information-behaviour; regardless of the nature of perceived or observed time-limitations, information-seeking or use in real-time was rare; and that information use was something that incurs opportunity costs – incursions into home life being the most prominent example.

Reported information-behaviour differed from observed information-behaviour. Nurses reported using 67 different sources of information in clinical decision-making. However, the 270 hours of observation revealed that engagement in information-seeking or retrieval in response to information need occurred only:

- Nineteen times in 115 patient visits or consultations (district nurses).
- Fifty-seven in 224 patients (practice nurses and nurse practitioners).
- Fifteen out of 55 patients (health visitors).

Almost all the sources consulted were colleagues from participants' own professional discipline or primary care team.

Perspective 1: The need to bridge the skills and knowledge gap

This perspective was characterized by a perceived deficit in information-handling skills, particularly using computers, as the following quote reveals:

Q: Do you have computer skills?

A: Minimal...if I want to look up somebody's address, phone number, stuff like that. (Site 2-DN-101)

Tried and tested information formats were preferred. Consequently, new forms of information had considerable hurdles to overcome before being used:

I have (travel vaccination) charts, which I am *used* to using. Something like the Internet, it depends how fast it is; if it was very slow then I wouldn't use it because I wouldn't have time in a 10-minute appointment with the patient. (Site 1-PN-9, participant's emphasis)

Participants stressed the requirement for 'broad' research-based information as a result of their generalist primary care roles:

In hospitals nurse practitioners are more specialist nurses – they've got a very distinct remit, it's very narrow, it's very specialised. I

would classify myself as a jack-of-all-trades and a master of none. (Site 3-NP-12)

Interpreting statistical information and technical language in research reports was a barrier:

I don't look at statistics because I hate them. So I read the blurb and I end up with a conclusion and if I think its OK I will read the whole article; but sometimes its just in a speak I don't understand, and it takes me too long to get round to sit and think about it. I would like it just in a plain straightforward language that we can actually use right away. (Site 1-HV-3)

Preappraised papers in journals and the use of appraisal guides addressed skills deficits to some degree, but were still not perceived as sufficient:

Statistics just floor you. I mean, how do I deconstruct what these people are actually saying? It's the language, it's not written for practising nurses. Maybe they should be publishing dual papers and putting them in the Nursing Times, although they're making an effort now. You want someone to tell you how do you evaluate the paper – this would be really nice: 'If it doesn't say this in the title, give it a nought', you know. Even with [appraisal] guidelines, it's still difficult to decide, it's not that straightforward. (Site 1-HV-7)

The differences in factor scores for items in perspective 1 and perspective 2 highlight the skills and knowledge gap: 'I have limited computer skills' (difference = 2.779); 'I don't have the necessary skills to search for research-information' (difference = 2.764); 'I don't really know about Medline, CINAHL or the Cochrane Library if I am honest' (difference = 1.801).

A similar picture emerged between perspectives 1 and 3: 'I have limited computer skills' (difference = 2.749); 'The language of research papers is difficult to understand' (difference = 2.35); 'I don't get enough practice to use the research related skills that I already have' (difference = 2.308).

Despite explaining 12% of the variance in the Q-sorts, none of the demographic characteristics was statistically significantly associated with the perspective, suggesting that skills and knowledge gaps amongst nurses in primary care cross demographic groups.

Perspective 2: Information formats need to maximize limited opportunities for consumption

This perspective was characterized by a need for summaries of research information:

You know, it's as if they've done a précis of the whole lot [the research on promoting breast feeding] so it's, like, snappy. I hate reading anything that is randomised controlled trials and all that. So it's the fact that it's a précis that's great.

(Site 3- HV-12, discussing an Effective Healthcare Bulletin, an evidence-based summary of research produced by the Centre for Reviews and Dissemination in the UK – <http://www.york.ac.uk/inst/crd/>)

Summarized information sources presented as solutions to the problem of lack of time for appraisal or reflection (such as clinical guidelines) were often seen as lagging behind advances in clinical practice:

They [guidelines] get out of date very quickly. Research is always ongoing, so things like that [wound care] you'd probably be best to stick to journals or asking colleagues or whatever. (Site 1-DN-7)

Guidelines were seen as necessary, but not sufficient, aids to decision-making; however, relying on oral and experiential modes of knowledge transfer to disseminate guidelines sometimes led to unanticipated outcomes:

She'd used a stethoscope to take some readings and I said, 'Who taught you how to do that'. She said, 'Well, it's in your protocol'. I said, 'No it's not, because I typed them'. But somebody had shown her that and she's used it. But had she actually read it? You only need one person to be doing something wrong. (Site 3-CNS-24)

Those defining this theme rejected deficits in skills, knowledge or motivation as major barriers to research use. The negative integers in the sample factor array below reveals that nurses saw the statements as 'least representative' of their position on barriers to the use of evidence for decision-making:

- Personally, I am just not that interested when it comes to research (-5).
- Truly, I don't understand research (-4).
- I don't have the necessary skills to search for research information (-4).
- I feel a bit threatened or anxious about using research actually (-3).
- I don't really know about MEDLINE, CINAHL or the Cochrane Library (-3).

Engaging with research information was something that happened away from work, often in relation to continuing professional development. Attempts at using research in response to recognized information needs did not always reinforce the positive behaviour:

If you're looking for clinical evidence about a specific problem relating to the management or the treatment of a certain condition, it (The Cochrane Library) might be somewhere that you might look.

But it's very clinical; it doesn't give you much else other than X number of randomised controlled trials about such and such, and this is what they found. So it's not one that I would use. (Site 2-NP-8)

Again, these participants did not perceive access to electronic or on-line resources as barriers to research information use. This can be seen by examining the positive and negative directions of the differences in factor scores between this and the other perspectives. Respondents defining perspective 2 were more likely to find the lack of summarized (difference = 2.78) and targeted (difference = 2.24) information a barrier. Compared with those defining perspective 3, they viewed the organization's role in dissemination as a barrier (difference = 2.21) and recognized the importance of making regular use of the information-handling skills they already had (difference = 2.16). Those defining this perspective were less likely to see access (statement 10, difference = -3.13; statement 15, difference = -2.05), skills (statement 11, difference = -2.8) or commitment (statement 3, difference = -2.75) as barriers.

Despite accounting for 12% of the Q-sort variance, no single demographic characteristic was a statistically significant predictor of allegiance to this perspective.

Perspective 3: Limited access in the context of limited time

This perspective was characterized by the view that there was inadequate time for research information consumption, its incorporation into clinical practice, and production or updating of evidence. Excessive time commitment and the intrusion of information-seeking into home life were dominant barriers:

- I have no protected time in my job for seeking out research information (+5).
- You shouldn't have to use your time at home to look for or read research (+4).
- I have no time during consultations for seeking out research-based information (+4).
- I don't have time to use the library (+4).
- Changing practice based on evidence means a long-term commitment and I don't have the time (+3).
- I don't have access to the Internet or computerized databases (+3).
- I don't have the time to read the information that gets sent to me (+3).
- My role in the team means I can't access the practice, organization or Trust computers whereas others in the team (like doctors) can (+3).

There was a weak relationship between mode of professional preparation, perceived time constraints and limited

access. Those with the former (vocationally-orientated) State Registered Nurse qualification had the strongest association with this perspective ($\beta_{\text{standardized}} = 0.940$, $P = 0.01$); Registered General Nurses (mainly educated during the mid-late 1980s) had less of an association ($\beta_{\text{standardized}} = 0.68$, $P = 0.004$); diploma and degree-educated nurses (primarily educated after 1993 in our sample) had the lowest of all ($\beta_{\text{standardized}} = 0.41$ and 0.45 , respectively, $P = 0.01$ for both). Despite the observational data failing to support a relationship between diploma- or degree-educated nurses and their likelihood of using research-based information, they did appear (rhetorically at least) more *aware* of evidence-based information sources.

Discussion

Study limitations

From the outset we were committed to triangulating different research methods. The word length limitations for journal papers has meant trading off the richest descriptive material (often lengthy fieldnotes) against other, more concise, data. Therefore we have emphasized the interview and Q-data, with the consequence that some of the richness associated with observational data was lost.

Despite making use of multiple methods of data collection to explore the differences and similarities in reported and observed 'truths' in relation to information-seeking, we do not suggest that either version should carry more weight or is more 'correct'. The epistemological orientation of the research was ideographic and so our data simply reveal gaps in people's public accounts (as reported) and the 'private' face of information behaviour (as it was observed). This gap should not be seen as implying that somehow the participants were 'less than truthful' about their information behaviour. Researchers, however, should consider the presence of this gap, and ask whether self-reported behaviour is a means of adequately describing the phenomenon of information use in the context of clinical decision-making.

We have given a descriptive picture derived from one region of Northern England. Further research conducted in other areas, and using more nomothetic techniques, would need to be conducted in order to assess the extent to which our results apply elsewhere.

Uniting decision context and information behaviour: towards an explanatory framework

On one level, our results mirror those of other studies examining barriers to research utilization. Limited time for

research implementation and difficulty understanding statistics are frequently cited barriers (Walsh 1997, Dunn *et al.* 1998, Parahoo 2000, Griffiths *et al.* 2001, McKenna *et al.* 2004). However, such studies tend to treat nurses as a homogeneous group, experiencing uniform sets of 'barriers'. Our study reveals that nurses working in the *same* environments experience barriers differently. Barriers (and promoters) to research use are heavily contextualized (Rycroft Malone *et al.* 2002) and, whilst overarching elements of context – such as a lack of time for seeking information – pervade almost all accounts, these alone do not sufficiently explain differences in perspectives between nurses in the same clinical environments.

Systematic reviews of both critical appraisal training for healthcare professionals (Parkes *et al.* 2001) and interventions to increase the implementation of clinical guidelines (Grimshaw *et al.* 2004) offer few explanations. These reviews do, however, point to the lack of 'coherent theoretical frameworks of health professional [behaviour]...in the presence of different barriers and effect modifiers' (Grimshaw *et al.* 2004, p. XI).

Our study differs from others examining barriers to nurses' use of research information (Parahoo *et al.* 2000, Retsas 2000, Griffiths *et al.* 2001) in that we examined information behaviour *in the context* of clinical decision-making. Describing context is a vital component in understanding research utilization (Kitson *et al.* 1998, McCormack *et al.* 2002, Rycroft Malone *et al.* 2002). Many theoretical models highlight the importance of decision-making (Stetler 1985, Eve *et al.* 1997, Lomas 2003) in the research utilization process. Despite the importance of decision-making as context, few research studies address both simultaneously and even fewer develop explanatory models.

Our results suggest that an explanatory framework for information-behaviour in the context of clinical decision-making should recognize that perceived time limitations affect the perceived reality of information behaviour and that extracting value, and therefore knowledge, from research information is difficult. Consequently, information (in the sense of contextualized data) is not easily recalled and applied to clinical decisions – hence the reliance on more easily recalled experiential knowledge. One question that arises is whether this reliance is appropriate for *all* the decision tasks that nurses face. The theoretical framework proposed by Hammond (1988) suggests that it may not be.

The cognitive continuum (Hammond 1988) is one attempt to unite information use, modes of enquiry, and judgement or decision tasks. Hammond sees intuitive and analytic reasoning not as mutually exclusive but as poles of a continuum (Figure 1), with points of 'quasi-rationality' in-between. As

What is already known about this topic

- Studies examining the barriers to evidence-based practice abound but most rely on self-reported behaviour, and this has been shown to differ from observed reality.
- Context is an important but poorly-described component of models of research utilization.
- Nurses are active decision-makers but studies examining information behaviour in the context of clinical decision-making are comparatively rare.

What this paper adds

- Utilization of research evidence in practice is inhibited by skills and knowledge gaps, unhelpful information formats, and limited time for decision-making and information consumption.
- It is important to consider the nature of decisions when planning strategy for evidence-based practice.
- Individuals cluster around shared perspectives on the nature of barriers to information use in clinical decision-making, but simple demographic categories are unlikely predictors of likely perspective.

one moves along the continuum, the information needed to inform judgements or decisions changes. For example, data-based expert judgement requires formal data of some kind, whereas unsupported judgements do not.

The continuum is a useful theoretical device for framing barriers to research use in decision-making. First, manipulating judgement or decision task characteristics can shift a person's location on the continuum. Making task structures

simpler and less ambiguous and task presentation clearer are likely to induce analytic reasoning; with the accompanying need for evidence-based information (Thompson 1999a). Secondly, the theory suggests that better judgements and decisions are made when modes of inquiry and the characteristics of decisions are congruent (Hammond *et al.* 1987). Knowing more about the decision tasks in nursing may help promote *appropriate* modes of enquiry, effective provision of information for *effective enquiry*, and eventual judgement or decision performance.

The prevalence of decisions differs between professional sub-groups. District nurses, for example, made far more 'treatment' style decisions than health visitors (Thompson *et al.* 2004). Given that the utility of an information source is sensitive to the nature of the decisions to which it is applied, it follows that decision-related barriers to the use of research-based information will vary with the prevalence of decision 'tasks'. District nurses illustrated this. They described assessing and treating chronic leg ulcers as a large proportion of their clinical workload. They also described using research-based education *in the context* of specific assessment (judgement) and treatment (decision) tasks, alongside decision support tools (such as the UK Royal College of Nursing's national leg ulcer guidelines) and decision feedback (in the form of clinical audit). This combination of task familiarity (born of frequency), knowledge provided through education, the simplification (structuring) of judgement/decision task and clinical information-gathering, 'feedforward' and 'feedback' of information about decision performance, and the presence of research-based systems to aid judgement, can be seen as one in which available information and mode of enquiry *match* the decision task. Whilst explicit real-time use

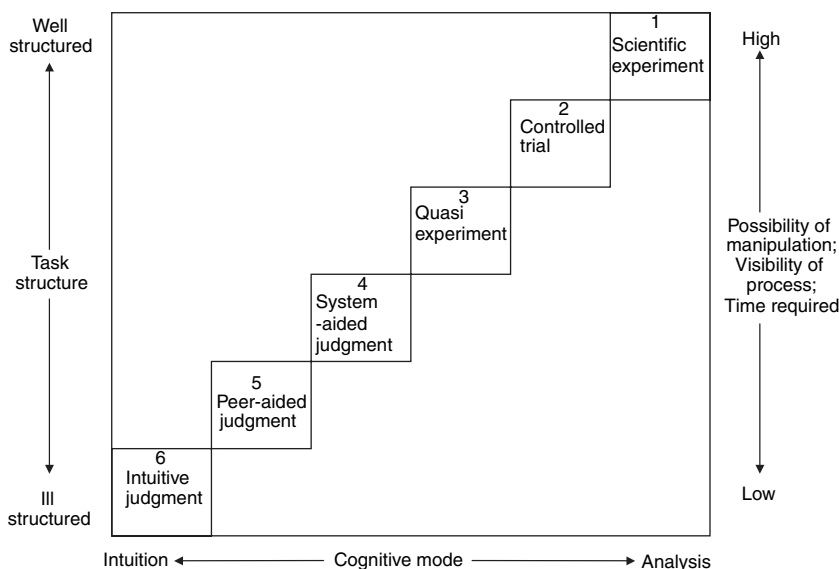


Figure 1 The cognitive continuum. Reproduced with permission from Hamm (1998).

of guidelines was limited, reported use of such materials was relatively high for this group, as was accuracy of recalled details of the guidelines themselves. Further research is needed both to describe whether this 'fit' applies to other areas of nursing and to design and evaluate interventions to increase the level of coherence between the decision tasks embedded in clinical practice and information use.

Conclusion

Perspectives on the barriers to research-based clinical decision-making are far from homogeneous. Simple demographics fail to offer significant clues to a nurse's allegiance with possible perspectives. This should not surprise us: systematic reviews of educational and other interventions to increase the role of research knowledge in decision-making suggest that strategies need to be theoretically informed in order to maximize their relevance to individual clinical decision-makers. The theoretical basis for many strategies to increase the use of research knowledge is often unclear.

Two conclusions follow from this. First, targeted implementation strategies will probably be the most fruitful approach (a finding which resonates with systematic reviews of change interventions). Moreover, such targeting could make use of ideographic methods, such as Q-methodological modelling, which structure qualitative themes and elucidate the extent to which they are shared by participants and reveal the lines of demarcation between clusters of them. Secondly, change interventions should take into account the possibility that differences in the decisions or judgement tasks that nurses face play a part in their reliance on experiential data – alongside other well-surveyed barriers, such as low organizational support and limited access. There are clearly no 'magic bullets' when it comes to improving clinical decision-making, but incorporating knowledge of the decisions nurses face at least affords a clearer view of the target.

Acknowledgements

We would like to thank the UK Medical Research Council for funding the project from which this paper was generated and also the nurses, health visitors, general practitioners and patients who gave so graciously of their time in order to participate in the project.

Author contributions

CT and DM contributed to study conception and design, data collection, data analysis and drafting of the manuscript; DM, NC, TS, PR contributed to critical revisions of the manuscript

for important intellectual content; CT and TS contributed statistical expertise; CT to obtaining funding; CT, NC and TS contributed to supervision.

References

- Bautista C. & Deber R. (1989) Decision-making and problem solving in nursing: an overview and analysis of relevant literature. In *Literature Review Monographs*, vol. 3. University of Toronto, Faculty of Nursing, Toronto, pp. 1–37.
- Bowling A. (2002) *Research Methods in Health*, 2nd edn. Sage, Milton Keynes.
- Brown S.R. (1993) A Primer of Q-methodology. *Operant Subjectivity* 16, 91–138.
- Bucknall T. & Thomas S. (1997) Nurses' reflections on problems associated with decision-making in critical care settings. *Journal of Advanced Nursing* 25, 229–237.
- Case D. (2002) *Looking for Information*. Academic Press, London.
- Chumbler N.R., Geller J.M. & Weier A.W. (2000) The effects of clinical decision-making on nurse practitioners' clinical productivity. *Evaluation and the Health Professions* 23(3), 284–304.
- Gioffi J. (1997) Heuristics, servants to intuition, in clinical decision-making. *Journal of Advanced Nursing* 26, 203–208.
- Cogdill K.W. (2003) Information needs and information seeking in primary care: a study of nurse practitioners. *Journal of Medical Library Association* 91, 203–215.
- Covell D.G., Uman G.C. & Manning P.R. (1985) Information needs in office practice: are they being met? *Annals of Internal Medicine* 103, 596–599.
- Department of Health (2003) *Developing Key Role for Nurses and Midwives: A Guide for Managers*. Department of Health, London.
- Department of Health (1999) *Making a Difference: Strengthening the Nursing, Midwifery and Health Visiting Contribution to Health and Healthcare*. HMSO, London.
- Dunn V., Crichton N., Roe B., Seers K. & Williams K. (1998) Using research for practice: a UK experience of the BARRIERS scale. *Journal of Advanced Nursing* 27, 1203–1210.
- Eddy D. (1990) *Clinical Decision-making: From Theory to Practice*. Jones and Bartlett, London.
- Estabrooks C.A. (1999) The conceptual structure of research utilization. *Research in Nursing & Health* 22, 203–216.
- Eve R., Golton I. & Hodgkin P. (1997) *Learning from Facts. Lessons from the Framework for Appropriate Care Throughout Sheffield (FACTS) Project*. University of Sheffield, Sheffield. SCHARR Occasional paper no.97/3.
- Field P.A. (1987) The impact of nursing theory on the clinical decision-making process. *Journal of Advanced Nursing* 12, 563–571.
- Funk S.G., Champagne M.T., Wiese R.A. & Tornquist E.M. (1991) Barriers to using research findings in practice: the clinician's perspective. *Applied Nursing Research* 4, 90–95.
- Funk S.G., Champagne M.T., Tornquist E.M. & Wiese R.A. (1995) Administrators' views on barriers to research utilization. *Applied Nursing Research* 8, 44–49.
- Giroit E.A. (2001) Graduate nurses: critical thinkers or better decision-makers? *Journal of Advanced Nursing* 31, 288–297.
- Gladwell M. (2005) *Blink: the Power of Thinking Without Thinking*. Penguin, London.

- Glaser B.G. (1992) *Emergence vs. Forcing: Basics of Grounded Theory Analysis*. Sociology Press, Mill Valley, CA, USA.
- Griffiths J.M., Bryar R.M., Closs S.J., Cooke J., Hostick T., Kelly S. & Marshall K. (2001) Barriers to research implementation by community nurses. *British Journal of Community Nursing* 6(10), 500–511.
- Grimshaw J.M., Thomas R.E., Maclennan G., Fraser C., Ramsay C.R., Vale L. (2004) Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technology Assessment* 8(6), 1–84.
- Hallett C.E., Austin L., Caress A. & Luker K.A. (2001) Wound care in the community setting clinical decision-making in context. *Journal of Advanced Nursing* 31(4), 783–793.
- Hamm R.M. (1998) Clinical intuition and clinical analysis: expertise and the cognitive continuum. In *Professional Judgement: A Reader in Clinical Decision-making* (Dowie J. & Elstein A., eds), Cambridge University Press, Cambridge, pp. 78–105.
- Hammond K.R. (1988) Judgement and decision-making in dynamic tasks. *Information and Decision Technologies* 14, 3–14.
- Hammond K.R., Hamm R.M., Grassia J. & Pearson T. (1987) Direct comparison of the efficacy of intuitive and analytic cognition in expert judgement. *IEEE Transactions on Systems, Man and Cybernetics* 17, 753–770.
- Kenrick M. & Luker K.A. (1996) An exploration of the influence of managerial factors on research utilization in district nursing practice. *Journal of Advanced Nursing* 23, 697–704.
- Kitson A., Harvey G. & McCormack B. (1998) Approaches to implementing research in practice. *Quality in Health Care* 7, 149–159.
- Lauri S. & Salantera S. (1998) Decision-making models in different fields of nursing. *Research in Nursing & Health* 21, 443–452.
- Lomas J. (2003) Connecting research and policy. *ISUMA* 1(1), 1–10.
- Maclure M. & Willett W.C. (1987) Misinterpretation and misuse of the Kappa statistic. *American Journal of Epidemiology* 21, 161–169.
- McCaughan D., Thompson C., Cullum N., Sheldon T.A., Mulhall A. & Thompson D.R. (2002) Acute care nurses' perceptions of barriers to using research information in clinical decision-making. *Journal of Advanced Nursing* 39, 46–60.
- McCormack B., Kitson A., Harvey G., Rycroft Malone J., Titchen A. & Seers K. (2002) Getting evidence into practice: the meaning of 'context'. *Journal of Advanced Nursing* 38, 94–104.
- McKenna H., Ashton S. & Keeney S. (2004) Barriers to evidence-based practice in primary care. *Journal of Advanced Nursing* 45, 178–189.
- McKeowan B. & Thomas D. (1988) *Q-methodology*. Sage, London.
- Offredy M. (2002) *Decision-making by Nurse Practitioners in Primary Care*. University of Hertfordshire, Hertfordshire.
- Orme L. & Maggs C. (1993) Decision-making in clinical practice: how do expert nurses, midwives and health visitors make decisions? *Nurse Education Today* 13, 270–276.
- Parahoo K. (2000) Barriers to, and facilitators of, research utilization amongst nurses in Northern Ireland. *Journal of Advanced Nursing* 31, 89–98.
- Parahoo K., Barr O. & McCaughan E. (2000) Research utilization and attitudes towards research among learning disability nurses in Northern Ireland. *Journal of Advanced Nursing* 31, 607–613.
- Parkes J., Hyde C., Deeks J. & Milne R. (2001) Teaching critical appraisal skills in health care settings. *The Cochrane Database of Systematic Reviews*, Issue 3.
- Retsas A. (2000) Barriers to using research evidence in nursing practice. *Journal of Advanced Nursing* 31, 599–606.
- Royal College of Nursing (2003) *Defining Nursing*. Royal College of Nursing, London.
- Rycroft Malone J., Kitson A., Harvey G., McCormack B., Seers K., Titchen A. & Estabrooks C.A. (2002) Ingredients for change: revisiting a conceptual framework. *Quality and Safety in Health Care* 11, 174–180.
- Sandelowski M. (1986) The problem of rigor in qualitative research. *Advances in Nursing Science* 8, 27–37.
- Skinner B.F. (1969) *Contingencies of Reinforcement*. Appleton-Century-Crofts, New York.
- Stetler C.B. (1985) Research utilization: defining the concept. *IMAGE: Journal of Nursing Scholarship* 17, 40–44.
- Thompson C. (1999a) A conceptual treadmill: the need for 'middle ground' in clinical decision-making theory in nursing. *Journal of Advanced Nursing* 30, 1222–1229.
- Thompson C. (1999b) Qualitative research into nurse decision-making: factors for consideration in theoretical sampling. *Qualitative Health Research* 9, 815–828.
- Thompson C., McCaughan D., Cullum N., Sheldon T.A., Mulhall A. & Thompson D.R. (2001a) Research information in nurses' clinical decision-making: what is useful? *Journal of Advanced Nursing* 36, 376–388.
- Thompson C., McCaughan D., Cullum N., Sheldon T.A., Mulhall A. & Thompson D.R. (2001b) The accessibility of research-based knowledge for nurses in United Kingdom acute care settings. *Journal of Advanced Nursing* 36, 11–22.
- Thompson C., McCaughan D., Raynor P., Cullum N. & Sheldon T. (2004) *The Potential for Evidence-based Primary Care Nursing: Clinical Decisions and Research Information-use by Primary Care Nurses – Final Report*. University of York, York (available from <http://www.clinicaldecisionmaking.org.uk>).
- Walsh M. (1997) Barriers to research utilisation and evidence-based practice in A&E nursing. *Emergency Nurse* 5, 24–27.
- Yin R. (1994) *Case Study Research*, 2nd edn. Sage, London.

Appendix A Q-sample and factor array – barriers to use of research based information

Q-sample item	Factor score 1	Factor score 2	Factor score 3
1. I have no time during consultations for seeking out research-based information	5	4	4
2. I have no protected time in my job for seeking out research information	4	4	5
3. Changing practice based on evidence means a long-term commitment and I don't have the time	-1	-2	3
4. You shouldn't have to use your time at home to look for or read research	1	2	4
5. I don't have time to use the library	2	1	4
6. Using on-line or computer-based information sources like MEDLINE takes too long	2	0	2
7. Producing and updating protocols takes too much time	0	0	3
8. I don't have the time to read the information that gets sent to me	1	1	3
9. The people who write research often have little clinical credibility	-4	-3	2
10. I don't have access to the Internet or computerized databases	-2	-3	3
11. I don't have the necessary skills to search for research information	2	-4	2
12. Electronic sources of information (like MEDLINE) are not very user friendly	0	1	2
13. I only get access to research abstracts, and if it looks interesting then it means having to go to the library	1	1	2
14. I don't have the necessary passwords to use the computers in my practice or organization	-4	-2	1
15. My role in the team means I can't access the practice, organization or Trust computers whereas others in the team (like doctors) can	-3	-1	3
16. The practice or Trust doesn't get specialist journals on subscription	-1	2	-2
17. The financial costs of getting hold of research are too high	-2	0	1
18. American journals don't really relate to UK practice	0	0	1
19. I can't get funding to do courses that have a research training element	-2	0	1
20. I only really get to see and use research when I am doing courses, and I'm not always on courses!	0	0	0
21. Study days are always held in paid work and so this makes it difficult to attend	-2	1	2
22. Protocols and guidelines lag behind clinical practice	-1	4	2
23. Our books, files and reference materials are out of date	-1	3	0
24. PRODIGY, MENTOR or the computer templates are out of date	-2	0	1
25. I don't really know about MEDLINE, CINAHL or the Cochrane Library if I am honest	1	-3	2
26. I'm not really sure what is actually in an Effective Healthcare Bulletin or Bandolier	1	-1	1
27. I haven't seen Clinical Evidence	-3	-2	-1
28. Our protocols are not really based on research evidence	-3	-1	0
29. My practice or Trust is not terribly good at disseminating information sources such as reports	-2	2	-3
30. GPs are all so different in the extent to which they tell you about research findings	3	3	-1
31. Some of the people I work with are overzealous in their enthusiasm for research and I find it off-putting	-1	-2	0
32. There have been so many changes and new directives lately that using research findings comes pretty low on my list	2	-1	-1
33. My role in primary care means I am a 'Jack/Jill' of all trades so looking at research means I end up looking too broadly at research rather than being able to focus on one narrow aspect	4	3	0
34. I just bin the information that gets sent to me	-4	-4	1
35. I know that looking at research is important but I don't really have the ability to read it properly	1	-1	0
36. You can't trust information from the Internet	-1	0	0
37. My past experience in training to use research has been overwhelming	0	0	-1
38. We don't get summaries of research findings, which might be more useful	3	5	-2
39. Personally, I am just not that interested when it comes to using research	-3	-5	-2
40. My colleagues are not keen on change and so trying to implement research is a bit of a waste of time	-1	0	0
41. Nobody actually adheres to guidelines anyway	-5	-1	-3
42. I feel a bit threatened or anxious about using research actually	0	-3	0
43. Implementing research is all well and good but where is the money going to come from?	1	1	1

Appendix A (Continued)

Q-sample item	Factor score 1	Factor score 2	Factor score 3
44. I find reps are not as pro-active in meeting my information needs as other kinds of information	1	2	-1
45. Nurse advisors from companies are not a good source of information as they are even less neutral than reps	0	2	-1
46. I don't get enough research information sent directly to me regarding the products I use	2	3	-2
47. Truly...I don't really understand research	-2	-4	-2
48. Research often just says what I always felt anyway	0	-1	0
49. There is no evidence out there for most of the decisions I make	-3	-2	0
50. The evidence is often just so contradictory	1	1	1
51. Most research evidence just isn't relevant to my clinical decisions	-2	-1	0
52. I find statistics and the numbers a real block on me reading and understanding research findings	4	1	-1
53. The language of research papers is difficult to understand	3	1	-2
54. Practice or team meetings are not really suited to using research	0	1	-4
55. Our practice development facilitator is not really active enough in promoting research	0	2	-3
56. Getting hold of research evidence is such a slow process that by the time I get it I've forgotten why I need it...or it just isn't useful anymore	0	-1	-1
57. I don't get enough practice to use the research related skills and knowledge that I have	2	2	-4
58. Getting on-line or electronic material to meet my information needs makes clinical problems more rather than less complex	2	0	-2
59. My managers don't support the idea of me looking for information in work time	-1	-1	-4
60. The internet is good for home-related information needs but not really for work	0	-2	0
61. I find the internet good for 'facts' but not really very good for informing what I actually do with a patient or how I might manage someone's condition	3	2	-1
62. I find that I need to use others to get information for me rather than getting it myself	1	-2	-3
63. The choice of what information I can get hold of is determined mainly by the limited choice in the surgery or team office	2	0	-5
64. I have limited computer skills	3	-3	-3
65. I think a lot of the computerized templates and protocols are not really that appropriate for nurses	-1	0	-2
66. Looking for information in work time is not appropriate	-1	-2	1
67. I find it hard to get hold of specialists or experts who might be able to help when I am unsure of what to do in practice	0	3	-1